

FLIGHT

First Aero Weekly in the World.

Founder and Editor: STANLEY SPOONER.

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport.

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EDITORIAL COMMENT.



LAST week in our opening Editorial views for 1916 we "had visions" of the foundation of a British Air Service, which was to have no limits to its expansion until it was assured that our Empire held in the Air the same supreme dominion of being able to enforce right and justice, in the years to come, as was now being done by our silent Navy on the seas, should the world once again have the misfortune thrust upon it of a similar menace to freedom, by which the Germanic powers had sought to enslave the entire world to their will and methods. The exact words in which our "visions" were summarised were as follows:—

"Nineteen-sixteen will, we believe, lay the foundation stone for a British Air Service, a service which shall years hence become greater even than our all-powerful Navy. For the moment this attempt at looking into the

future may appear to be fantastic, but we believe most earnestly that we are in no way over-estimating the pinnacle to which the navigation of the air will attain. It will, of course, mean the establishment of the Third Service, which, however, by force of its superior power to strike a vital blow at any moment, will presently claim its position as being the First Service in the defense and in offense on behalf of our Empire."

Now we think these are worth repeating, for since they were written, things have happened which may, and should, have in them the germs of great things. Should these germs but fructify to even a restricted degree, we shall be well satisfied that once again a prophecy of ours is on the road to achievement, although, maybe that road is going to be a long one to traverse.

If you turn to the appointments to the British Air Services, which appear on page 30 of "FLIGHT," it will be seen that Flight Lieut. Noel Pemberton-Billing is gazetted a Squadron Commander. In the same breath we learn that Mr. Pemberton-Billing has retired from the R.N.A.S., and that the advancement in rank was but a prelude to this action on his part; there can, therefore, be no doubt about the fact that "P.B." has retired with flying colours. Mr. Pemberton-Billing, since he has been in the R.N.A.S., has seen and thought many things. He has, enthusiast as he always has been as to the future of aviation, realised that if this country is to come out top dog in the air, the sooner the Government set to work seriously to see that that position is attained the better. He has therefore taken a bold plunge by resigning his position in the Royal Naval Air Service of this country, on which he had, during his short connection with it, already found it possible to leave his impression. His object is to become the advocate in Parliament for the very extended air policy which has been so strongly urged in the past in "FLIGHT." The opportunity has occurred for him to make the attempt to obtain a seat in the House, with this object, by the vacancy brought about in the Mile End constituency by the succession of the Hon. Harry Lawson to the Peerage. He has not been slow to seize the chance, and by the time these lines are printing he will

have issued his address and ideas of what he proposes to stand for. Primarily, he is very Imperial in his views of the British Air Service, and for this reason we welcome his candidature, and wish him a sweeping success in the eastern constituency. Pemberton-Billing is a man of phenomenal energy, holds the very extremest of views, and endeavours to put those views forward in the most insistent manner, until he has demonstrated their soundness or the reverse. He is thoroughly acquainted with all sides of the aviation movement, and therefore knows what the Empire requires for its salvation in the air. We understand it will be his endeavour in Parliament to see that the Empire gets it. His knowledge and experience as a constructor in the campaign before him should serve him in good stead, and as it is Mr. Pemberton-Billing's intention, we understand, to part entirely with all his interest in the commercial side of aviation, there should arise no question of his having some ulterior personal gain in view as the object of his fight for the extension of the air fleet. From his knowledge of aviation he is not likely to be led astray by a

lot of flap-doodle statements emanating from those who have some axe to grind of their own. His one aim should, and we believe will be, to fight for such recognition by the Government of the vital necessity of Britain having supremacy in the air, that the wherewithal will be forthcoming to enable an early if not immediate move towards that end. The task is a big one under existing conditions, but as Pemberton-Billing is a live man and not only knows his subject but has it dearly at heart, we have confidence that he may carry his object, by sheer demonstration of facts, figures and the necessity of the situation.

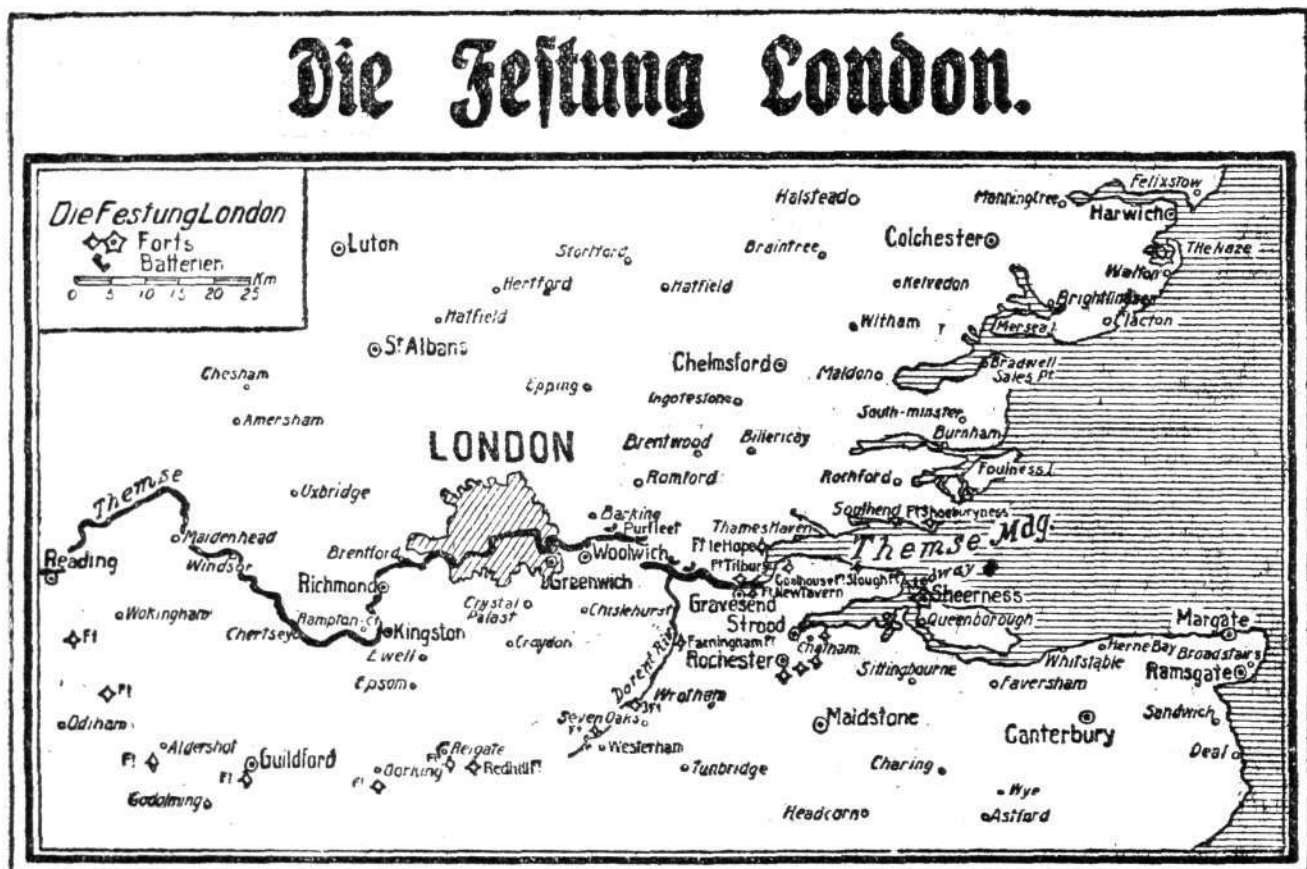
Once this point has been reached, it may be safely left to the manufacturers to rally round and see that there is no sliding back by reason of the difficulties in the way. Into details of possibilities it would be unwise to enter, in fact it would be highly inadvisable, but so many promising channels are open ready for exploitation that we are hopeful we may find in Mr. Pemberton-Billing the successful candidate for Mile End. It should certainly be another step forward in the evolution of our dominion of the air.



LONDON—THROUGH GERMAN EYES.

JUDGING from the articles which have been appearing in the German newspapers recently, endeavouring to justify the air raids upon the residential districts of London, there should be every prospect shortly, subject to weather conditions, of attempted repetitions of the Zeppelin pirates' murderous visits. The latest effusion, from the *Frankfurter Zeitung*, which is accompanied by the map below, is suggestive but hardly convincing. Such argu-

ments, however, no doubt, appeal to our dear German cousins, who appear never so pleased as when they hear of further and still further attacks upon helpless women, children, and non-combatants. It is hardly a sound *tu quoque* to claim that we have placed guns to keep off these aircraft, and therefore they are justified in continuing their raids. But that has little weight with such a depraved nation as the Germans have proved them-



The map which was published by the *Frankfurter Zeitung*, purporting to show the "fortification works of London," and which is supposed to justify wholesale raids—past and future—by Zeppelin aircraft, on the residential districts of London.

selves to be in warfare. The *Frankfurter Zeitung* explains the "fortification works of London" as shown on the map as follows:—

"London, like every modern fortress, is provided with a line of fortification works, which, placed at great distance from the city, are intended to defend the latter from hostile bombardment, and protect its important barracks, depôts, factories, harbours, and docks.

"Before the existence of our superior air weapons, the bombardment of London was possible only from land or sea. By water bombardment could only have been carried out by enemy ships which could pass the Thames mouth. Therefore the fortifications, which are to defend London against sea attack are grouped around the mouth of the Thames.

"To these belong, in the first instance, the works at Shoeburyness, east of Southend, and the works liberally furnished with guns south and south-west of Southend. On the sea side of the Thames



London's Anti-Aircraft Defences.

IN the House of Commons on Tuesday Mr. King asked whether officers and men of the Royal Artillery were now doing duty on anti-aircraft guns and searchlights, and if the work could, wherever possible, be entrusted to other men, preferably those above

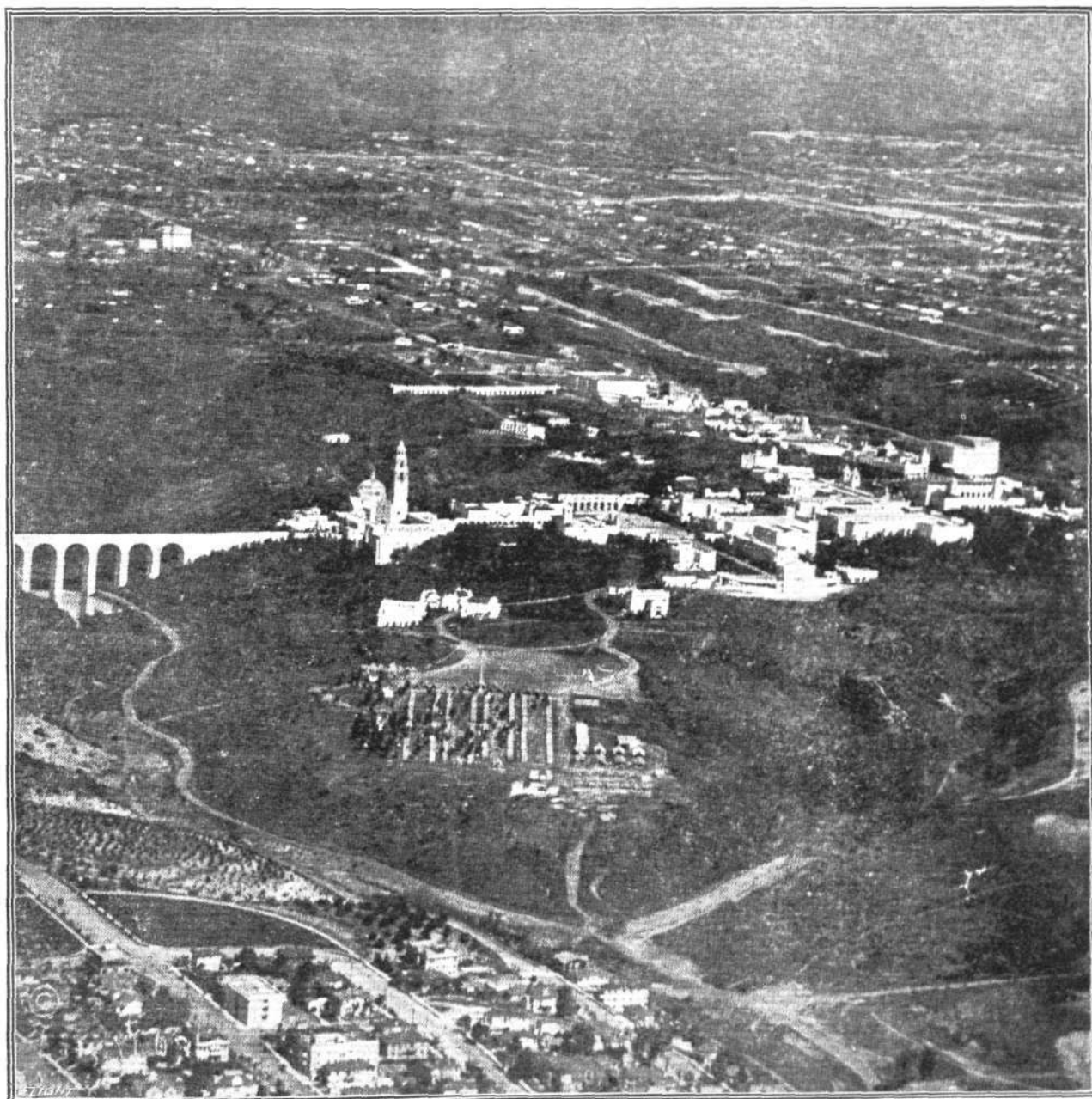
then come the defended port of Sheerness with the Barton Point fort, the Garrison Point fort, and the lines lying between. The works then extend along the right bank of the Medway and bend southerly around Chatham and Rochester. Other works follow the line of the Thames on both banks to London. The names of these are specially well known—Slough fort, Hope Point fort, Coalhouse fort, as well as Tilbury fort and the New Tavern fort at Gravesend. Other batteries are mounted at Purfleet and up-stream as far as Woolwich Arsenal.

"The works defending London on the land side are built in the form of a one-sided bridge-head from the Thames west of Gravesend, extending in a large arc south of London into the region south of Reading. There are forts at Farnham on the Darent River, north-west of Sevenoaks, north and north-west of Westerham, at Redhill, Reigate, Dorking, Guildford, and Aldershot.

"This tabulation only concerns works which were already built in peace time. In addition there are all the numerous works which have come into existence round London during the war."



the military age. Mr. Tennant replied that it had been found that the men above military age were not quick enough in service of the guns to be considered suitable for engaging in this particular work. Every endeavour was being made to relieve men fit for service abroad.



FROM ABOVE.—San Diego Exposition Grounds, photographed from a Curtiss flying boat at an altitude of about 2,000 ft.

The British Air Service

"PER ARDUA AD ASTRA"

UNDER this heading are published each week the official announcements of appointments and promotions affecting the Royal Naval Air Service and the Royal Flying Corps (Military Wing) and Central Flying School. These notices are not duplicated. By way of instance, when an appointment to the Royal Naval Air Service is announced by the Admiralty it is published forthwith, but subsequently, when it appears in the LONDON GAZETTE, it is not repeated in this column.

Royal Naval Air Service.

THE following appeared among the Admiralty announcements of the 5th inst. :—

Temporary Flight Sub-Lieut. S. O. Smith, granted the acting rank of Temporary Flight-Lieutenant, with seniority of Jan. 2nd, and appointed to "President," additional, for R.N.A.S.

C. K. Chase (Corporal, Easton Machine-Gun Brigade), granted a temporary commission as Sub-Lieutenant (R.N.V.R.), with seniority of Dec. 30th, and appointed to "President," additional, for R.N.A.S.

The following appeared among the Admiralty announcements of the 7th inst. :—

Lieut.-Commander J. L. Longstaff, to the "President," additional, for R.N.A.S. To date Jan. 6th.

The following appeared in the *London Gazette* of the 7th inst. :—

Temporary Acting Flight-Lieut. Noel Pemberton-Billing has been promoted to the rank of Temporary Squadron-Commander. Jan. 1st, 1916.

The following appeared among the Admiralty announcements of the 8th inst. :—

Commander R. A. S. Hunt graded in R.N.A.S. as Wing-Commander. To date Nov. 11th.

Flight-Commander (Royal Flying Corps, Special Reserve) Capt. the Hon. W. F. Forbes-Sempill (Master of Sempill), granted a commission as Flight-Commander for temporary service, and appointed to the "President," additional, for R.N.A.S. To date Jan. 1st.

P.O. Mechanic H. C. Lemon promoted to temporary Sub-Lieutenant (R.N.V.R.), and appointed to the "President," additional, for R.N.A.S., for Observer's Duties. To date Jan. 7th.

The undermentioned have been entered as Probationary Flight Sub-Lieutenants (temporary), and appointed to the "President," additional for R.N.A.S., to date as stated: M. W. H. Evans; Jan. 10th. C. J. Wyatt; Dec. 6th. W. R. Walker, Nov. 24th. W. B. Edwards and H. H. Arundel; Dec. 16th. J. A. Harman; Dec. 9th. J. Gorman; Dec. 5th. J. O. Galpin; Nov. 26th. W. H. Mackenzie; Dec. 11th.

The following appeared among the Admiralty announcements of the 10th inst. :—

W. F. Cleghorn and L. H. Parker, both entered as Probationary Flight Sub-Lieutenants (temporary), with seniority of Dec. 16th, and appointed to "President," additional, for R.N.A.S.

Royal Flying Corps (Military Wing).

THE following appeared in the *London Gazette* of the 4th inst. :—

Supplementary to Regular Corps.—Second Lieutenants (on probation) confirmed in their rank: Dennis Cox, Charles L. Willcox, C. I. Van Nostrand and Frederick C. A. Wright.

To be Second Lieutenants (on probation): Montague V. Morgan; Nov. 17th, 1915. Alfred J. Johnston; Nov. 25th, 1915. George F. Underwood; Dec. 28th, 1915. Samuel W. Dunkley; Jan. 3rd, 1916.

The following appeared in a supplement to the *London Gazette* issued on the 5th inst. :—

Flying Officers.—Dec. 18th, 1915: Second Lieuts., Special Reserve, C. I. Van Nostrand, F. C. A. Wright, C. L. Willcox and D. Cox.

Supplementary to Regular Corps.—Reginald M. Motabhoj to be Second Lieutenant (on probation). Dec. 23rd, 1915.

The following appeared in a supplement to the *London Gazette* issued on the 6th inst. :—

Flying Officers.—Dec. 16th, 1915: Capt. Guy R. Howard, D.S.O., Essex Regt., Special Reserve; Lieut. George A. Parker, Northamptonshire Regt., and to be seconded; Lieut. James G. Selby, R.A., and to be seconded; Temporary Second Lieut. M. A. J. Orde, A.S.C., and to be transferred to the General List; Second Lieut. Geoffrey J. Reid, Prince of Wales's (North Staffordshire Regt.), Special Reserve, and to be seconded; Second Lieut. Verschoyle P. Cronyn, Special Reserve; Second Lieut. J. O. Andrews, Royal Scots (Lothian Regt.), and to be seconded.

Supplementary to Regular Corps.—Second Lieutenant (on probation) Verschoyle P. Cronyn is confirmed in his rank.

Lieutenants, Canadian Militia, to be Second Lieutenants (on

probation), Dec. 7th, 1915: G. M. Murray, William C. Gage, William L. Richards, C. E. Rogers, A. K. Tylee, John S. Shaw, London P. Watkins, Edward J. Watkins, George C. Husband, Alastair Ross, Joseph A. G. Gilroy, Paul R. Meredith, John H. Kelly, Norman C. Millman, and C. E. Robertson.

To be Second Lieutenants (on probation), Dec. 7th, 1915: V. C. Gordon, N. J. Macdonald, J. L. Dashwood, R. S. Carroll, W. O'Hara, K. H. Jarvis, W. L. Scandrett, R. H. Lane, T. L. Brennan, G. H. Armstrong, G. E. Hewson, and J. B. Brophy.

The following appeared in the *London Gazette* of the 7th inst. :—

Attached to Headquarter Units.

Staff Officers, Royal Flying Corps (graded for pay as *Staff Captains*), Nov. 27th: Maj. A. L. Godman, Yorks., from General Staff Officer, 3rd Grade; Maj. R. J. Armes, N. Staffs., from General Staff Officer, 3rd Grade; Capt. C. Bovill, R.A., from General Staff Officer, 3rd Grade; Capt. R. R. de C. Grubb, 3rd Hussars.

Establishments.

Flying Officer.—Appointment of Lieut. J. J. Hammond, Special Reserve, in *Gazette*, March 12th, antedated to Nov. 26th, 1914.

Supplementary to Regular Corps.—Lieutenants (Temporary Captains) to be Captains; Dec. 1st: E. K. Davies, R. R. Smith-Barry, C. M. Crowe, H. C. Tower, G. C. N. Nicholson, F. H. Jenkins. To be Captains; Dec. 1st: Lieut. E. G. S. Walker, Lieut. (Temporary Captain) G. H. Eastwood. Second Lieutenants to be Lieutenants; Dec. 1st: L. F. Page, W. A. Grattan-Bellew, C. D. Fuller, J. O. Cooper, H. MacD. O'Malley, A. R. H. Browne, R. E. A. W. Hughes-Chamberlain, J. W. Woodhouse, A. C. Wright, F. W. Wright, A. Fitz R. P. H. Somerset-Leeke, R. H. Carr, F. Dunn, J. P. C. Cooper, A. C. Horsburgh, D. A. C. Symington, H. K. Maxwell, K. D. P. Murray, S. E. Neal, W. D. S. Sanday, F. A. G. Noel, V. S. Brown, A. B. Adams, G. D. Pidgeon, F. S. Creswell, H. S. Ebben, and G. D. Hannay.

The following appeared in a supplement to the *London Gazette* issued on the 8th inst. :—

Supplementary to Regular Corps.—Second Lieutenants (on probation) confirmed in rank: A. Hunt, S. Dalrymple, T. G. G. Bolitho, M. C. Evans, W. W. Stenning, C. G. Coe, A. E. Thorne, W. H. Date, R. K. C. Maguire, G. Jacques, E. S. Perrin, S. Allenby, W. C. Green. To be Second Lieutenants (on probation): H. J. N. Drope; Nov. 30th. E. B. Horlick; Dec. 11th. Surname of Second Lieutenant (on probation) R. H. Cronyn as now described, not as in *Gazette*, Dec. 22nd. Second Lieut. Walter C. Green is as now described, and not as stated in the *Gazette* of Nov. 5th, 1915.

The following appeared in a supplement to the *London Gazette* issued on the 10th inst. :—

Attached to Headquarter Units.

Staff Captain.—Temporary Capt. C. F. Lee, West Somerset Yeomanry (T.F.), from a Wing-Adjutant, Royal Flying Corps. Dec. 18th, 1915.

Establishments.

Flying Officers.—Second Lieut. Lawrence A. Wingfield, Royal Fusiliers (City of London Regt.), Special Reserve, and to be seconded; Dec. 20th, 1915. Dec. 21st, 1915: Major S. Smith, R.F.A. (T.F.); Lieut. Dermot J. Sheridan, Princess Victoria's (Royal Irish Fusiliers), and to be seconded; Temporary Lieut. E. R. M. Griffin, A.S.C., and to be transferred to the General List; Second Lieut. Phillip B. Prothero, Princess Louise's (Argyll and Sutherland Highlanders), Special Reserve, and to be seconded; Temporary Second Lieut. A. T. Wynyard-Wright, East Surrey Regt., and to be transferred to the General List; Second Lieut. J. E. Evans, Royal Welsh Fusiliers, and to be seconded; Second Lieut. S. Dalrymple, Special Reserve. Dec. 24th, 1915; Second Lieut. Samuel J. Sibley, Special Reserve; Second Lieut. Charles I. Carryer, East Yorkshire Regt., and to be seconded; Second Lieut. Arnold Hunt, Special Reserve.

Memorandum.—Second Class Air-Mechanic Clifford S. Kent, from Royal Flying Corps, to be Temporary Second Lieutenant. Dec. 16th, 1915.

Central Flying School.

THE following appeared in the *London Gazette* of the 7th inst. :—
Officer in Charge of Experimental Flight (graded as *Squadron-Commander*).—Lieut. (Temporary Capt.) G. L. Cruikshank, D.S.O.,

Gordon H., a Flight-Commander, Military Wing, and to be Temporary Major whilst so employed, vice Lieut. (Temporary Major) E. L. Conran, 21st Lancers. Dec. 7th.

Commandant.—Capt. (Temporary Lieut.-Col.) D. le G. Pitcher, 39th K.G.O. Cent. India H., I.A., from Wing-Commander, and retain temporary rank whilst so employed, vice Capt. G. M. Paine, C.B., M.V.O., R.N. Dec. 10th.

Royal Flying Corps (Territorial Force).

The following appeared in the *London Gazette* of the 4th inst. :—
Hampshire Aircraft Parks, R.F.C.—Hon. Capt. in the Army James E. Pearce, to be Captain (temporary); Dec. 6th, 1915. To

be Lieutenants (temporary), Dec. 6th, 1915; Stanley W. Hiscocks, Percy Bishop, Harold Grinstead, and Henry L. Hall. To be Second Lieutenants, December 6th, 1915: Frank A. Short, Thomas H. L. Salisbury, Aubrey R. Langton, Algernon H. Lister, Henry D. Teage, and Arthur J. Elliott. Percival E. Crosson to be Quartermaster, with honorary rank of Lieutenant; Dec. 6th, 1915.

Aeronautical Inspection Department.

The following appeared in the *London Gazette* of the 7th inst. :—
Inspector of Engines—Lieut. (Temporary Capt.) R. H. Verney, A.S.C., from an Equipment Officer, and retain temporary rank whilst so employed, vice Capt. R. K. Bagnall-Wild, Reserve of Officers. Dec. 14th.

AIR WORK AT THE DARDANELLES.

IN the despatch of Sir Ian Hamilton, dated December 11th, and issued last week, regarding the operations in the Dardanelles, there was the following tribute to the British and French Flying Services :—

"In bringing this despatch to a close I wish to refer gratefully to the services rendered by certain formations, whose work has so far only been recognised by a sprinkling of individual rewards.

"Much might be written on the exploits of the Royal Naval Air Service, but these bold flyers are laconic, and their feats will mostly pass unrecorded. Yet let me here thank them, with their Commander, Colonel F. H. Sykes, of the Royal Marines, for the nonchalance with which they appear to affront danger and death, when and where they can. So doing, they quicken the hearts of their friends on land and sea—an asset of greater military

value even than their bombs or aerial reconnaissances, admirable in all respects as these were.

"With them I also couple the Service de l'Aviation of the Corps Expeditionnaire d'Orient, who daily wing their way in and out of the shrapnel under the distinguished leadership of M. le Capitaine Césari.

"The Armoured Car Division (Royal Naval Air Service) have never failed to respond to any call which might be made upon them. Their organisation was broken up; their work had to be carried out under strange conditions—from the bows of the 'River Clyde,' as independent batteries attached to infantry divisions, &c.—and yet they were always cheerful, always ready to lend a hand in any sort of fighting that might give them a chance of settling old scores with the enemy."

The Roll of Honour.

THE Secretary of the Admiralty has announced the following casualties :—

Under date January 6th :

Missing.

Flight-Commander Hans A. Busk, R.N.

Under date January 8th :

Killed.

Flight Sub-Lieutenant Sidney A. Black, R.N.

Undated :

Wounded.

P.O. Mechanic J. M. Auger.

The following casualties in the Expeditionary Force have been reported from General Headquarters :—

Under date December 30th :

Killed.

Second Lieutenant D. C. Cleaver, Royal Flying Corps.

Missing.

Second Lieutenant D. A. Glen, Manchester R. and R.F.C.

Under date January 1st :

Missing.

2259 1st Class Air-Mechanic W. Holden, Royal Flying Corps.

Undated :

Died.

Second Lieutenant P. M. Reed, Somerset L.I., 8th Batt., and R.F.C.

Correction :

Wounded.

Second Lieutenant G. Alchin, R.F.A., attached R.F.C.
Should read—

Lieutenant G. Alchin, R.F.A., attached R.F.C.

The following casualty among the Indian troops is reported from the Mediterranean Expeditionary Force :—

Undated :

Missing, believed Killed.

Second Lieutenant H. M. C. Ledger, Indian Army Reserve of Officers, attached R.F.C.



Photo. by Hana.

2nd Lieut. G. S. M. Insall, the Royal Flying Corps officer who obtained the V.C., December 23rd, for conspicuous bravery, skill and determination on a Vickers fighting machine on November 7th, 1915. The record of Lieut. Insall's deed appeared in *FLIGHT*, December 31st.



MR. NOEL PEMBERTON-BILLING, who, with the rank of Squadron-Commander, has retired from the R.N.A.S., in order that he may enter Parliament to advocate the extension of the British Air Service.

MR. NOEL PEMBERTON-BILLING.

MR. PEMBERTON-BILLING, who is so well known in association with aviation, and to whom further reference is made in our Editorial columns, at the request of an influential committee has decided to contest the vacancy caused in the Mile End Constituency by the succession of the Hon. Harry Lawson to the Peerage.

Mr. Pemberton-Billing was experimentally interested in aviation in this country at the same time that the Wright Bros. were endeavouring to solve the problem of heavier-than-air flying in America. He built his first man-lifting glider in this country in 1904. He also founded and edited a monthly review—entirely devoted to aviation—under the name of *Aerocraft* in the year 1908.

Before the war broke out Mr. Pemberton-Billing had a seaplane factory at Southampton, where he has devoted his energies to building experimental machines. After the outbreak of the war he offered his personal services, his machines and his factory to the country, and they were accepted. It is not possible, therefore, to speak in detail of any of the machines Mr. Pemberton-Billing has perfected, as they have now been taken over by the Government. Nor of course can the work actually done by Mr. Pemberton-Billing in the country's Air Service since the outbreak of the war be described at present for similar reasons, but the appreciation of its value was shown, when, on making up his mind to retire from the active service, at least for a time, in order to devote himself to the equally or even more important work of securing the proper development and employment of the country's Air Service, he was promoted to the rank of Squadron-Commander.

Mr. Pemberton-Billing naturally makes the formation of a vigorous air policy the plank of the platform on which he stands, and will appeal to the electors of Mile End to return him to the House of Commons as a practical airman. In so doing he points out that while both the Navy and Army are represented in both Houses by soldiers and sailors, as well as practical lay experts, the new and increasingly important Service of the Air is entirely unrepresented. "Nothing," he says, "can better show the evil results of this than the dangerous darkness into which the greatest and busiest city in the world is plunged every night, as being, in the

opinion of the present authorities, the only protection against raids by enemy aircraft. This darkness, besides being dangerous to life and detrimental to business, is by no means an effective defence against the danger it is supposed to combat. Place the aerial defence of London in the hands of practical airmen, and the danger will be met where alone it can be promptly and efficaciously dealt with—that is, in the air. A Government Committee of the practical airmen should be formed at once to deal promptly with this and other important matters connected with the Air Service."

As a practical aviator who recognises how London can be freed from its present unnecessarily humiliating conditions, a contention which has been consistently kept in view in "FLIGHT," Mr. Pemberton-Billing holds strong views upon other vexatious legislation, somewhat foreign to the interests with which "FLIGHT" is concerned, which has, from time to time, been recently introduced, frequently to little purpose, and which in most cases has served to occupy the time of our legislators when they should have been employed upon the consideration of matters more vital to the Empire.

Few men have had a more active and adventurous life than Mr. Pemberton-Billing. In addition to seeing active service in the present war, he went through the South African Campaign, serving on the staff of General Buller, to say nothing of several Kaffir affairs in earlier days. Essentially an Imperialist, he knows his subject at first hand, having served his country at home and in the Colonies, afloat, ashore, and in the air—as sailor, soldier, in the Colonial Mounted Police, as rough-rider; in earlier days a boxer of repute and an all-round athlete—and as aviator. One of the most expert of racing motorists, he took the first motor car to South Africa, and founded and edited the first motor paper there. He has raced motor boats, and sailed and steamed nearly every other kind of vessel; has shot big game, is a crack shot, has worked as a labourer in a dozen different ways, in as many parts of the world. "Just to see," as he says, "how the working man works, thinks and lives." The energy which Mr. Pemberton-Billing has for some years bestowed on these and other forms of activity, he now proposes to devote to the forwarding of the Air Policy of Great Britain. And may good luck go with him.



The Kaiser and a Zeppelin Trip.

Writing under date Jan. 6th, the *Morning Post* correspondent at Petrograd says:—

"The *Bourse Gazette* contains an interesting and circumstantial account of a flight in a Zeppelin which nearly cost the Emperor William his life. It has been officially denied in Germany that his Majesty was aboard the ill-fated Zeppelin, but the crew and officers were especially rewarded, according to the *Kriegszeitung*, for 'saving the Emperor's life during a flight at the front.' The Zeppelin was 'No. 18,' and sleeping, working, and reception rooms had been specially fitted for his Majesty. Most of the details have been obtained from intercepted letters, from which the *Bourse Gazette's* correspondent pieces together the following story. The Zeppelin in question was the flagship of the first light squadron of airship 'Dreadnought' cruisers. The observation cabin was fitted in the floor with a window constructed on the principle of binoculars magnifying seventeen times and measuring over a yard across. Among the other novelties were special parachutes to serve the purpose of lifebelts at sea in case of extremity. The Emperor wore pilot's kit.

"After several postponements this important flight of the Emperor was finally fixed for a day on which drizzling rain fell. The Zeppelin quickly rose above the clouds into brilliant autumn sunshine, and landed quite regularly at Warsaw, where it was met by an Austrian Archduke and a guard of honour. The Emperor



emerged, watch in hand, bidding those present to note how precisely punctual was the airship's arrival. Half an hour later the trip was resumed, apparently towards the fighting front of the German armies.

"It was now that things began to go wrong. The engines stopped, and mechanics hastened along the corridors and climbed outside ladders. The Emperor was told that an accident, common enough with Zeppelins, had happened, namely, that one of the screws had broken and was tearing into the aluminium envelope and causing a wastage of gas. This screw was to be changed while moving, and, after it had been isolated, the engines started again for home. Spare screws are always carried. Nevertheless, the repairs seemed to be inadequate and the loss of buoyancy increased beyond normal limits. The airship began to list heavily, and a parachute was prepared for his Majesty's use. The commander of the airship telegraphed to earth and the whole countryside was quickly aroused, cavalry and motors flying in all directions in obedience to the notification to prepare for a descent at any moment and anywhere.

"The engines were stopped, and everything having weight was flung overboard, even the officers' swords being jettisoned. But the huge machine continued to fall until, by a great stroke of luck, its anchor caught some trees, and the airship reached the ground without actual disaster. Apart from official recognition by orders and medals, every officer and man concerned received special rewards from the German Emperor personally, and the intercepted letters of pilots contain details of these awards."

The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

Aviators' Certificates.

THE following Aviators' Certificates have been granted:—

- 2248 Second Lieut. Rudolph Dunstan Vavasour, R.F.A. (Maurice Farman Biplane, Military School, Norwich). Dec. 9th, 1915.
- 2249 Second Lieut. Alfred Ellison (General List) (Maurice Farman Biplane, Military School, Catterick Bridge). Dec. 16th, 1915.
- 2250 Flight Sub-Lieut. Eric Barton Thompson, R.N.A.S. (Maurice Farman Biplane, Royal Naval Air Station, Chingford). Dec. 19th, 1915.
- 2251 Flight Sub-Lieut. Robert Henry Horniman, R.N.A.S. (Grahame-White Biplane, Graham-White School, Hendon). Jan. 5th, 1916.
- 2252 Sergt. John Grant McKenzie Martin Stronach, R.F.C. (Maurice Farman biplane, Military School, Shoreham). Jan. 5th, 1916.
- 2253 Lieut. Edye Rolleston Manning, 15th Hussars (L. and P. Biplane, London and Provincial School, Hendon). Jan. 9th, 1916.

Aeronaut's Certificate.

The following Aeronaut's Certificate has been granted:—

- 59 Warrant Officer Alfred Charles Wright, R.N. Jan. 10th, 1916.

New Year Honours.

The King has been graciously pleased to give orders for the following promotion in the Most Honourable Order of the Bath:—
K.C.B.

Col. Henry Capel Lofft Holden, C.B.

(Sir Capel Holden has been a Vice-Chairman of the Club since 1913).

Grant of the Victoria Cross.

The King has been graciously pleased to approve of the grant of the Victoria Cross to Squadron-Commander Richard Bell Davies, D.S.O., R.N.

(Squadron-Commander R. B. Davies has been a Member of the Club since 1911.)

Extension of the Hours of Opening the Club.

The Club is now open from 9 a.m. to 10.30 p.m.
each day, including Sunday.

THE FLYING SERVICES FUND

administered by

THE ROYAL AERO CLUB.

THE Flying Services Fund has been instituted by the Royal Aero Club for the benefit of officers and men of the Royal Naval Air Service and the Royal Flying Corps who are incapacitated on active service, and for the widows and dependants of those who are killed.

The Fund is intended for the benefit of all ranks, but especially for petty officers, non-commissioned officers, and men.

Forms of application for assistance can be obtained from the Royal Aero Club, 166, Piccadilly, London, W.

Subscriptions.

| | £ | s. | d. |
|---|--------|----|----|
| Total subscriptions received to Jan. 4th, 1916 ... | 10,381 | 5 | 8 |
| O. W. Thomas ... | 10 | 10 | 0 |
| An Admirer of the Air Services of England ... | 0 | 5 | 0 |
| Collected at the Westland Aircraft Works, Yeovil (Fourteenth contribution) ... | 0 | 12 | 6 |
| G. A. Scott ... | 2 | 2 | 0 |
| W. Pryor (Fourth contribution) ... | 5 | 0 | 0 |

Total, January 11th, 1916 ... 10,399 15 2

166, Piccadilly, W. B. STEVENSON, Assistant Secretary.



London Aerodrome, Collindale Avenue, Hendon.

Grahame-White School (R.N.A.S.).—Straights with instructor last week: Probationary Flight Sub-Lieuts. Aitkin, Burden, Colquhoun, Cook, Cuckney, Durston, Jones, Kingsford, Maxted, Newton, Rampling, Rees, Rockey, Templeton and West. *Brevet* during week: Probationary Flight Sub-Lieut. Horniman.

Grahame-White Civilian School.—Straights with instructor: Messrs. Butler, Leigh, McClaughrie, Matthews, Parkinson, Verguitt, Grasset, Hathway, Howe, Smith, Eichelbrenner and Lewis. Circuits with instructor: Mr. Hallet.

Instructors during week: Messrs. Manton, Pashley, Russell and Winter.

Beatty School.—The following pupils were out during last week: Messrs. Baldwin, Baker, Barnes, Barrow, Branford, Brand, Brynildsen, Cumming, Drysdale, Dunne, Edwards, Fellowes, Godfrey, Greenhill, Markham, Martin, Mattos, Mossop, Owen, Podmore, Samter,

Schollaert, Whincup, Young, d'Allesina, Sellars, Jaquin, Hoskins, and le Champion.

The instructors were Messrs. G. W. Beatty, W. Roche-Kelly, G. Virgilio, R. W. Kenworthy, A. E. Mitchell, and L. L. King, the machines in use being Beatty-Wright dual-control and single-seater propeller biplanes and Caudron tractor biplanes.

Hall School.—The following pupils were out receiving instruction last week:—With Cecil M. Hill and H. Stevens: Messrs. Redford, Nicolle, Captain Grey, Stirling, Evans, Mann and Dresser, doing circuits, eights, *vol plané* landings, &c., alone. With John Drew and Anstey Chave: Camberbirch, Arnsby, Wooley, Ormerod, Smith, Millburn, Chapman, Neal, Rochford, Thom, Roberts, Rayne, Ackroyd Collins, Ridley and Lieut. Cooke.

A very good Royal Aero Club certificate was taken by Captain Grey in a nasty bumpy wind on the 10th inst.

Machines in use: Hall and Caudron Government type tractors.

London and Provincial Aviation Co.—Pupils doing rolling last week: Messrs, Verbessem, Darwin, Henderson, Egelstaff, and Snow.



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A couple of officers who have passed for their brevets at the Grahame-White Naval School: 1. Flight Sub-Lieut. S. G. Beare, R.N.A.S.; 2. Prob. Flight Sub-Lieut. A. Gammon, R.N.A.S.

Straights: Messrs. Van Roggen and Thorp. The latter is just ready to take his brevet.

Instructors: Messrs. W. T. Warren, M. G. Smiles, C. M. Jacques, H. Sykes, and W. T. Warren, jun.

Several days have been too windy for school work.

Ruffy-Baumann School.—Owing to the continual

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bad weather, last week, most of the work connected with the school was confined to inside the sheds. Some flying, however, was effected by the following pupils: With



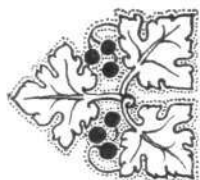
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Two pupils who have taken their tickets at the Hall School: 1. Mr. H. S. Broad; 2. Mr. J. Drew.

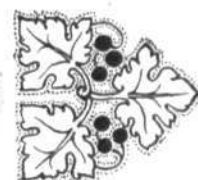
instructor: Flanders, Hamtiaux, Pauli, Winter, Edgar, Muspratt, Thomsen, and Durand. Straights: Vernon, Griffith and de Launoit.

Instructors: Ed. Baumann, Felix Ruffy, Ami Baumann and Clarence Winchester. Machines in use; 60 and 50 Caudron-type dual-control biplanes.

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FLYING AT HENDON



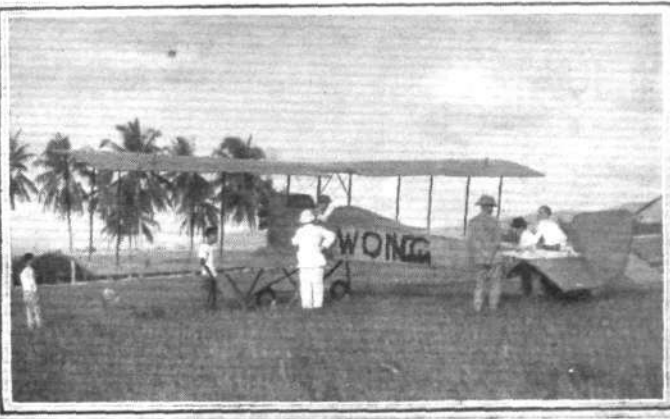
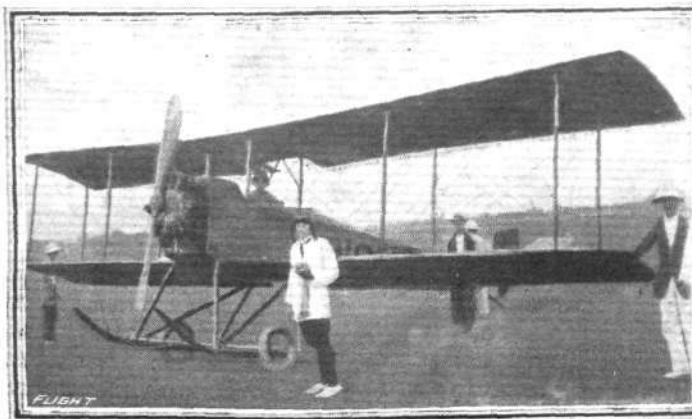
LAST week-end's flying at Hendon was for the most part made up of school work. On Saturday there was a fairly stiffish wind blowing, and it was not until well into the afternoon that the various schools got going. In addition, however, several exhibition and test flights were put up. J. H. Moore made three flights, two with passengers, on his 50-55 h.p. biplane, and H. Sykes went up on a 45 h.p. L. and P. biplane. One of the 100 h.p. De Havilland pusher scouts was very much in evidence during the afternoon, piloted I believe by De Havilland, who put up some remarkably steep banks and

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climbs. These fine little 'buses appear to be considerably faster now than when first introduced, and ought to be capable of real good work at the front. Other machines seen were some B.E. 2cs, a Curtiss, a Burgess (Sturtevant) pusher, and a Maurice Farman "long-horn."

Sunday's flying was much of a muchness, school work and a few passenger flights. J. S. B. Winter and M. Osipenko were busy with the 60 h.p. G.-W. 'buses, and R. Kenworthy put up some seven flights on the 50 h.p. Beatty-Wright, whilst A. E. Mitchell was out on the 45 h.p. Beatty-Caudron.

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Two views of Mr. Wong's biplane on the Kuala Lumpur racecourse at Selangor, Federated Malay States. (See p. 38.)

A "POPULAR" TYPE AEROPLANE DESIGN.

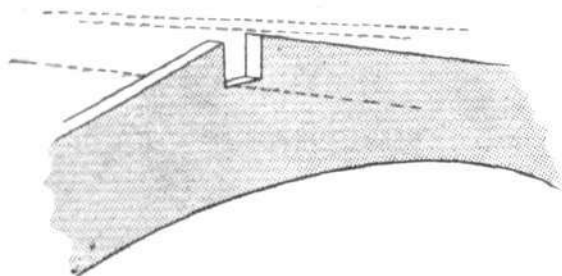
By C. M. POULSEN.

(Continued from page 17.)

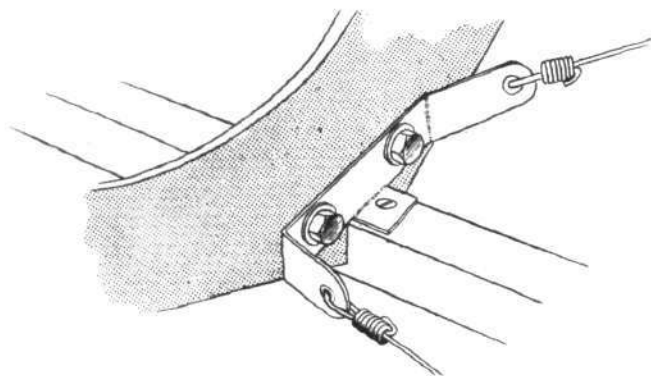
HAVING decided on the general outline of the body, the next thing to be done in the design of our machine is to see how we can carry out the construction of it in such a manner that the nearest approach to the perfect streamline of the model B.F. 36 is obtained. The *monocoque* type of construction has already been discarded as being too costly for our purpose of designing a low-priced aeroplane. The first alternative that comes to mind is the girder type of *fuselage*. When it is desired to incorporate rounded sides with this form of construction, it is general practice to retain the rectangular section *fuselage* built up of four *longerons* connected by struts and cross-members. To each bay of the girder are then attached

point clear. While by having a sufficiently large number of stringers a very close approximation to the circular section may be obtained with this type of body, the disadvantages pointed out render some other form advisable, and we must therefore try to hit upon an arrangement in which all members are doing useful work.

This object is attained by letting the *longerons* perform at the same time the duty of stringers. The result, it will be easily seen, is a compromise, since the greatest possible number of stringers is an advantage from the point of view of resistance, while for constructional reasons the number of *longerons* should be kept as small



Sketch showing how *longerons* are partly let into the formers.



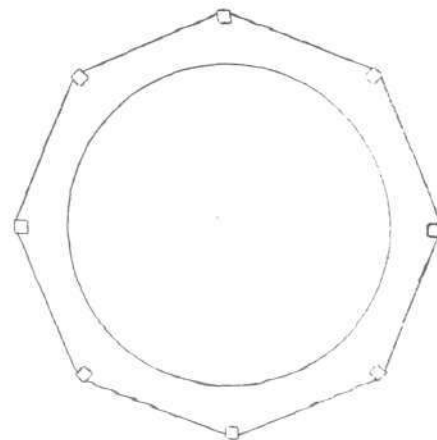
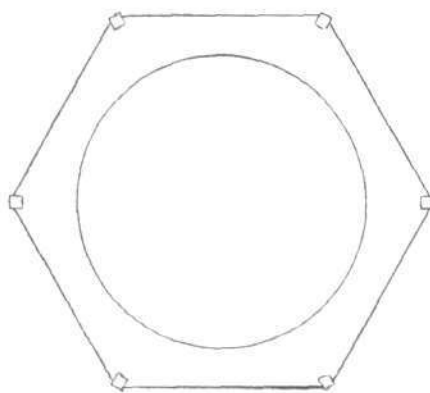
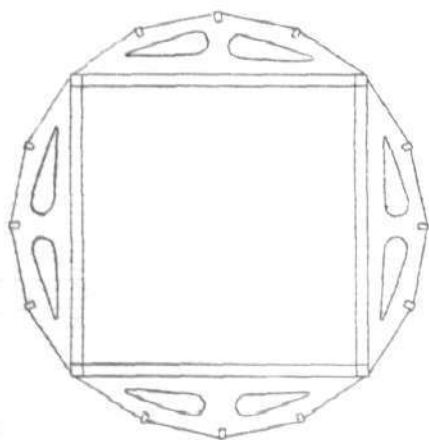
The wiring plates which also secure the *longerons* to the formers.

segment-shaped formers, frequently made of three-ply wood, which support thin strips of wood running longitudinally.

Let us examine the merits and disadvantages of this form of construction. The rectangular main structure is easy and cheap to make, and commends itself to our purpose on that account. The objection to it, however, is that the whole outer portion—i.e., the formers and stringers—is doing very little work beyond providing the fair shape, not helping to any appreciable extent to

as possible. Suppose we make the *fuselage* of hexagonal section. With an overall diameter of 3 feet we obtain with this form flat sides of considerable area, while, if we make the formers—which are, of course, really struts and cross members in another form—of 3-ply wood and of the shape shown in the second sketch, there is as much waste of internal space as in the rectangular section body.

Let us now try to add another two *longerons*, and see whether and how this improves matters. Sketch No. 3



Various methods of obtaining polygonal sections with the girder type of *fuselage*.—On the left an ordinary square section surrounded by stringers mounted on three-ply formers. In the centre a hexagonal section with the *longerons* mounted on three-ply formers. On the right a similar construction, but with 8 *longerons*.

strengthen the body, while adding considerably to the weight. Apart from this disadvantage, the rectangular body surrounded by stringers wastes room, since for a polygonal section of 3 ft. diameter the space left inside the struts is approximately 2 ft. only. A reference to one of the accompanying sketches should make this

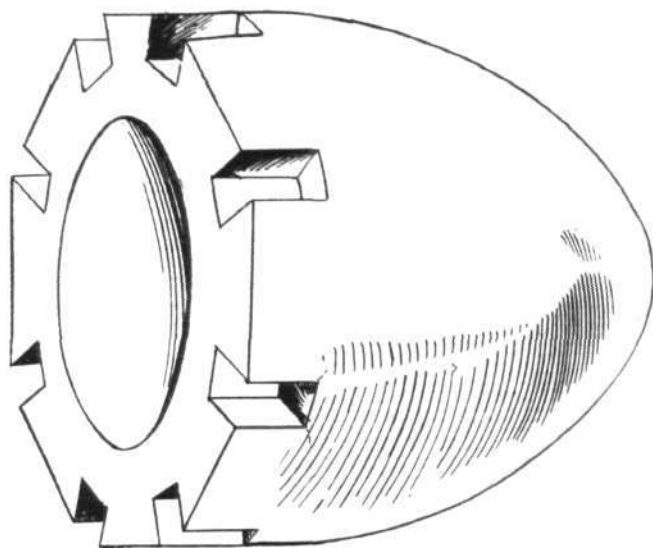
shows that a considerable improvement in section is obtained by choosing the octagonal type. Also the space taken up by the formers is considerably reduced. If still more *longerons* be added, the resultant section approaches very closely to the circle, but then the angle of the bracing wires begins to become too flat, unless we place

the formers at very short intervals. Everything considered, it would appear that it would be better to sacrifice any reduction in resistance that might accrue from adding more sides to the polygon, since with eight *longerons* a reasonably good shape is obtained, while the various bays of the girder can be made of fairly standard proportions. We could, by adding a stringer between every two *longerons*, obtain a slight reduction in head resistance, but it is questionable whether the gain thus obtained would be sufficient to be worth the extra trouble and expense.

If, then, we decide on a body with eight *longerons*, the next step is to design a suitable support for these. Three-ply formers have already been suggested, and a simple form of these, which could be quickly and cheaply made, is shown in the right-hand sketch. As the *longerons* will taper from the pilot's seat to the stern, I would suggest that it be best to buy the three-ply wood in squares of suitable size, and cut out the octagon and circle oneself. As for the method of securing the *longerons* to the formers, I suggest wiring plates similar to those shown in the sketches. These would be very cheap to make, and should be quite suitable for the purpose. As a matter of fact, it would probably be possible to dispense entirely with the use of wire-strainers, at any rate in the rear portion of the body, since the bolts passing through the wiring plates and formers could be made to perform the function of strainers, and a considerable saving—both in weight and cost—thereby effected. If the bolts were made sufficiently long and all the bracing wires in each bay were bent over two pegs so as to be of exactly the same length, the tightening up of the bolts should put the same amount of tension in each wire and a true shape be obtained. A little experimenting might be required before the exact length of wire was found, but once this had been accomplished the board with the pegs for all the wires would be kept and thereafter the exact length of the wire in any bay would be known. As a matter of fact this method is, I believe, employed on the Wright biplanes without any means for tightening up afterwards, so that it would seem that with the extra tension that can be put on the wires by means of the

bolts, as suggested, it would be a very economical way of effecting the cross-bracing. Of course if objections were taken to the method, it would be a simple matter to incorporate strainers, as the bolts would then simply be used to hold down the wiring plates.

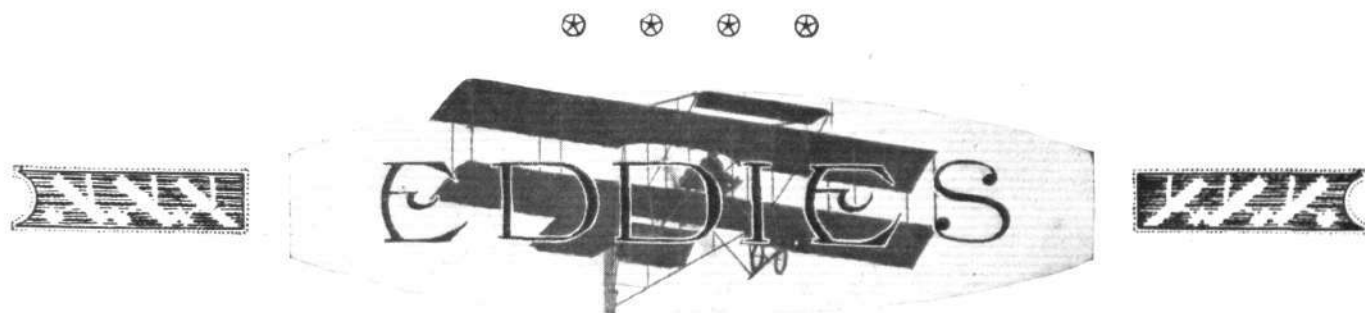
Before going any further with our design, we can decide pretty well on how to terminate the tail end of the body. To form an anchorage for the rear end of the eight *longerons*, I would suggest a tail-piece of the shape



The tail piece which terminates the body.

shown in the sketch. If made of spruce and hollowed out it should not be prohibitively heavy, and would be made to take the horizontal tubes for the elevator and the vertical rudder-posts. Having now decided on our general body design and on the details of the construction for the rear half, we can begin to draw out an outline of the body. The details of the front part will probably have to be somewhat modified when the wing attachment comes to be studied, but this problem will form the subject of the discussion in our next issue.

(To be continued.)



I WAS chatting to a pilot the other day about flying in general and speed in particular. During the conversation he happened to remark that he had noticed a very distinct falling off in speed as the altitude increased, and wondered at the reason for this. It is quite well known to pilots that the speed does drop with height, and the cause, I believe, is generally supposed to be that a smaller charge is taken in by the engine, as evidenced by the fact that as the altitude increases the petrol has to be cut down to avoid too rich a mixture. If any reader can offer a more "scientific" explanation we shall be glad to give it hospitality in these columns for the

benefit of others who may be less familiar with such side issues in connection with practical aviation.

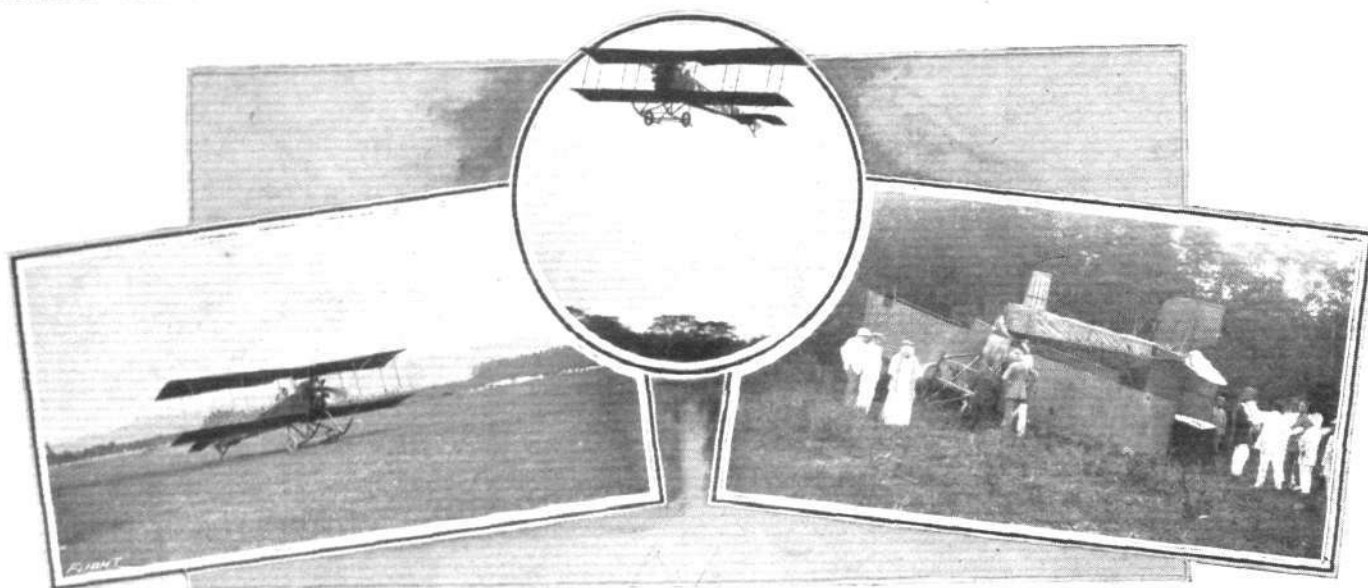
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A time recording clock has been installed at the Beatty school, and is a source of much amusement to the pupils who are not used to "checking in" and "checking out." In consequence a great deal more card punching than is strictly necessary is going on. And it is not only the pupils' cards that are punched, but anything that will go into the slot. I am told that it is quite a common thing for anybody wanting to "know the time" to go to the new recorder and get the time of day stamped on any

bit of card or paper which happens to be handy. Ah, well, boys will be boys.

A correspondent in Sepang, Selangor, Malay Peninsula, sends along the accompanying photographs of the 100 h.p. Anzani-engined biplane built by Messrs. Wong and Lawford. This machine was taken out to the Straits

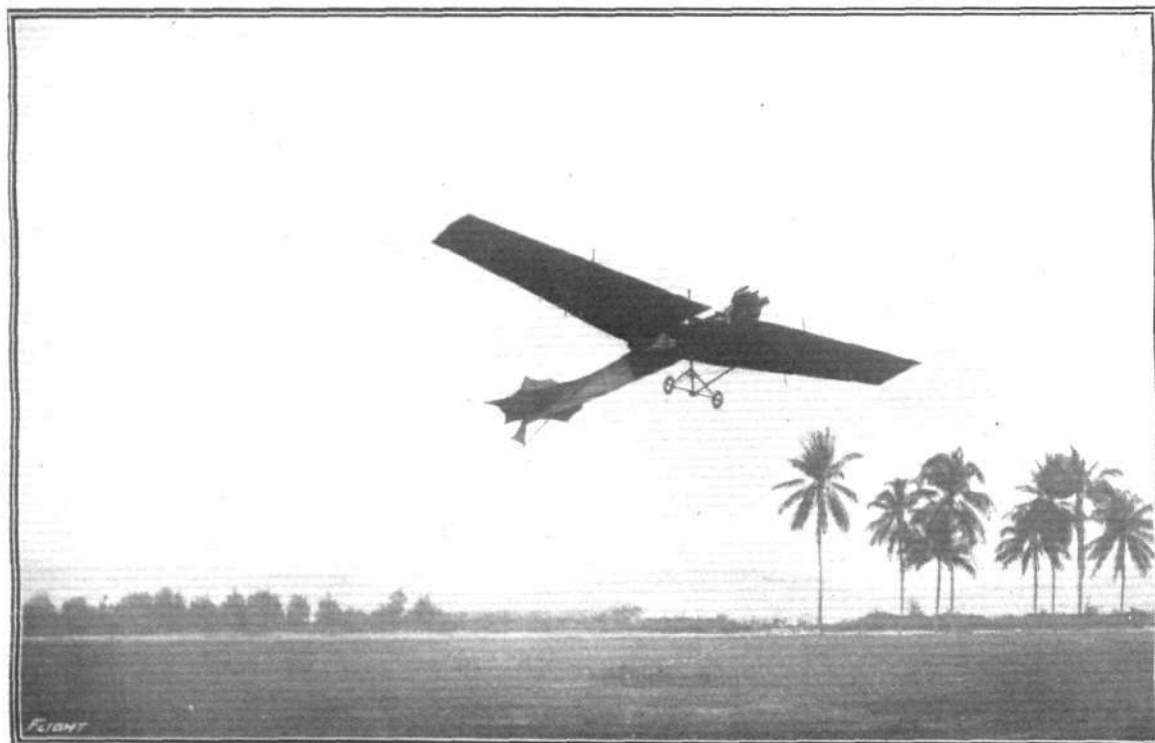
bad landing was made with the result shown in one of the photos. Mr. Wong fortunately was not hurt, so that one may perhaps take it for granted that she will be repaired, or, if this be impossible, a new machine constructed. In all probability the engine is not seriously damaged, so that even at worst the construction of a new 'bus should not mean a very large outlay of capital. It



AN UNFORTUNATE EXHIBITION FLIGHT BY MR. WONG'S BIPLANE AT SELANGOR.—From left to right the pictures show the start, in full flight, and the smash.

Settlements during 1914. Mr. Wong, who may be remembered as the constructor of the Tong Mei biplane, being in charge. Through his connections out there Wong hoped to start an interest in aviation, and took out the machine in order to give practical demonstrations. For quite a long time nothing had been heard of him until the arrival of this letter, which states that several good flights were put up during early morning hours, but that later on during a demonstration flight a

is to be hoped that Mr. Wong will succeed in carrying out the work he has started and thus help to spread the interest in aviation. As a matter of fact this machine is not the first to fly in the Malay States, an Antoinette monoplane, piloted, I believe, by the Dutch aviator Kuller, having made flights out there as early as the beginning of 1911. Another of our photos. shows one of these. The old graceful Antoinette does not look at all out of place in its unusual surroundings. *ÆOLUS.*



A Reminiscence.—An Antoinette monoplane flown by a Dutch pilot at Selangor, Federated Malay States, in 1911.



ARMCHAIR REFLECTIONS



By THE

"DREAMER."

I SUPPOSE the week-ending habit which had taken such a hold on the people of England before the war, has received somewhat of a set-back now, for reasons which will be many and various. But I have a week-ending habit which I can enjoy now, as ever; which does me a world of good, which does not cost me a penny-piece to indulge, and which I can highly recommend. I simply go to bed on Saturday night, and there remain until Monday morning. Of course I don't mean that I have my meals in bed, that would be unthinkable.

The *modus operandi* is this:—Sunday morning, lie in bed till nine. Get up, Muller's exercises, cold bath (uugh!), dressing gown, slippers, and descend to breakfast. After the meal, gather up all the papers and magazines (one must be selfish in this matter), together with smoking tackle and writing pad, and go back to bed. Read, write, smoke and sleep until lunch time. Afternoon, dose repeated till tea time. Evening, ditto, missing dinner, which miss is in itself a splendid thing on occasion, and helps not a little towards health. Monday morning, arise fresh as a lark at an hour which will cause consternation to the household, who will pass rude remarks with regard to one's *compos mentis*, but withal, that feeling that one wants to go out and pull up trees, or push a 'bus over. Should Sunday be one of those dark, wet, miserable days we wot of, I draw the window curtains, switch on the light, and deceive myself that it is night. Those days produce a large slice of the hump in the most optimistic of us, and are better shut out.

This is one of the finest tonics I know of, and will not only revive your drooping spirits, if you try it, but also those of all the rest of the household, who will arise in arms, and resent it with all their might, and so cause a quickening of their pulses so likely to become flaccid with hum-drum household life, with a corresponding rise in energy, and consequently in health.

This Sunday morning, I was lying in bed busily engaged in trying to hang a smoke ring over the electric globe descending from the centre of the canopy, and, incidentally, watching the morning sun melt the white frost from the roof opposite, when I heard the familiar roar of an engine overhead. I live within gunshot of one of our aerodromes, and am used to these visits. On any other day, I should have rushed out to glimpse at it, just to satisfy myself whether it was an Avro or a B.E. or what not, and to speculate in my mind whether it was some familiar up there, or an advanced pupil, or both, or somebody else.

This being Sunday morning, however, and one of my week endings, I contented myself with just watching below the top of the window frame until it should appear, which it eventually did, sailing majestically away at some six or eight hundred feet.

Then I fell to thinking of aeroplanes, and pilots, and the war, and what aviation was doing for us, and of the great things pilots were doing "out there." I thought of the ability and pluck shown on every occasion by our service pilots. Of the battles in the air. Of machines

of the enemy shot down. Of risks taken and honours won. Of crosses and medals and D.S.Os. Of D.S.Ms. and "mentioned in despatches," and of the limelight waiting to be turned on to any one of these, our fighting aviators. And my thoughts veered round to the pilot-instructor, the man who teaches these young Britons to go out and do things, the man who takes the raw material, and turns it into one of the grandest fighting units ever known, because a pilot has to use his own initiative and methods. He has no commander up there with him to govern and order, to advise and instruct. He is his own C.O., Head-quarters Staff, Officer, Non-com, battery and rank and file, all rolled into one. He must plan his own attack, and carry it out himself. He must manoeuvre and dive and climb and bank to avoid hurt, and get into position to hurt others. And here in England there are men who are teaching him to do all this. Men who never come out into the limelight. Men with no chance of distinguishing themselves; no chances of winning medals and crosses: one of them was flying over my house this morning in the biting north-east wind, whilst I lay idly on my back blowing smoke rings.

Out there, pilots take risks. They do not get their honours thrust upon them; they have to be earned. But here, at home, the pilot-instructor works hard and takes risks. He does not mind the hard work, he does not mind the risk he takes in going up with inexperienced pilots who have control for the first time. It is his duty to take those inexperienced men and teach them to become first-class pilots, and it cannot be done without a great deal of hard work and personal risk. In every aerodrome in this country there are pilot-instructors in every way fitted to go out into the war area and win laurels for themselves, but their duty is at home, where they can be of far greater use than bringing down enemy aeroplanes, but where, it has occurred to me, they are likely to be overlooked when the presents are handed round off the Christmas tree.

Would it be too much, I wonder, and should I be thought impudent, were I to suggest that most—if not each and every one—of the pilot-instructors in the service, teaching service flyers, should receive some token of recognition? The medal and order is bestowed for distinguished service, and, although the pilot-instructors do not operate at the seat of war, surely they are performing services at home which are not only distinguished, but absolutely incalculable in the value and greatness of results indirectly achieved.

Great Britain is mightily proud of her sons to-day, in whom she has every right and title to be, and she has shown herself not backward in according honour where honour is due. Therefore it is possible, and I humbly beg to suggest it to the consideration of those in authority, that the Service Pilot-instructor is doing great things in turning out those magnificent Service Flyers, that his services ARE distinguished, and that if he were presented with some outward and visible sign to that effect it would be a reward well placed and faithfully earned.

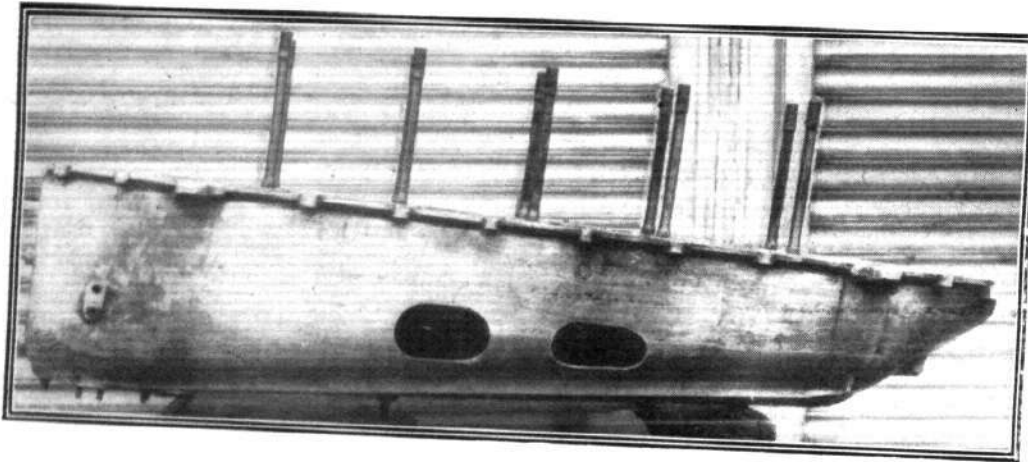
THE 160 H.P. MERCEDES AERO ENGINE.



WHEN the three captured German aeroplanes were amongst the exhibits "staged" on the Horse Guards Parade last November we were able to get little more information regarding their engines than was to be learned by any inquisitive visitor who cared to use his eyes and common sense. For the benefit of those readers of "FLIGHT" who were unable to pay that visit, or, having done so, were unwilling or had no opportunity to attempt

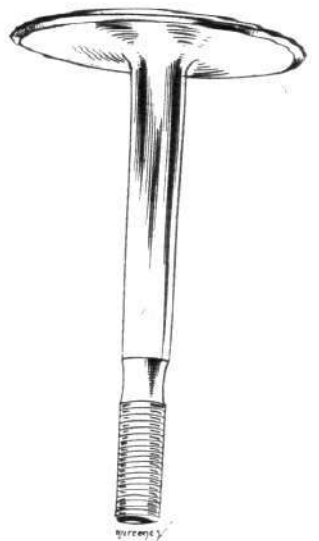
photographs and sketches. The result of our labours we now publish in the belief that they will be of interest to readers of "FLIGHT," and, not unlikely, to those especially who are concerned in any way in the manufacture or designing of aero engines.

It is hoped that in the near future, investigation by analysis of the materials employed in the construction of this engine will make these available, but until this has been done we are only in a position to indicate what such appear to be when judged solely by the eye—a not very satisfactory method owing to the very restricted



Bottom half of the base-chamber of the Mercedes engine, showing the two apertures forming the air intake to the carburettor, which is mounted on the opposite side of the engine.

"Flight" Copyright.

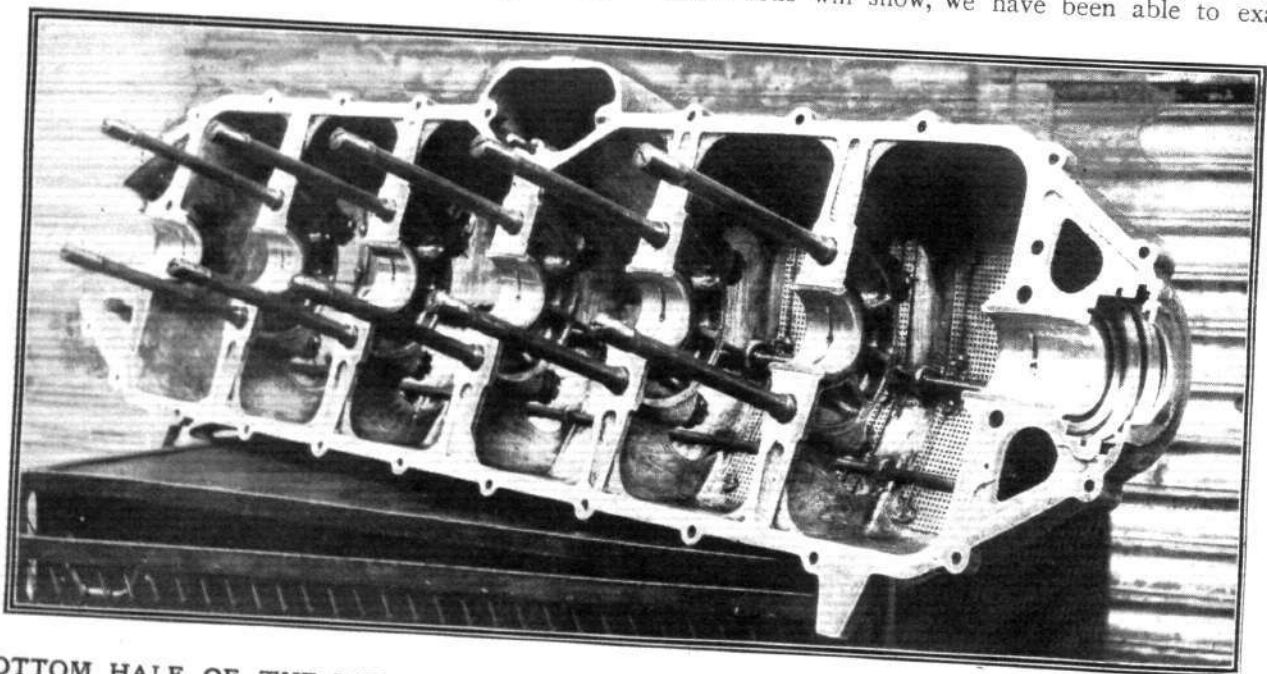


A Mercedes valve.

to elicit particulars for themselves, we did so for them, and presented the result in the form of an illustrated article that appeared in our issue dated December 3rd. Since that time the most important of the three engines—the big Mercedes—has been completely dismantled, and we have had an opportunity of examining it in close detail for ourselves, and of taking further

limits of determination this affords—for which reason every reference to materials made in the following notes must be accepted with the reserve that under the circumstances is necessary.

Of the design, however, we can write without any sense of restraint, since, as we have said, and as our illustrations will show, we have been able to examine



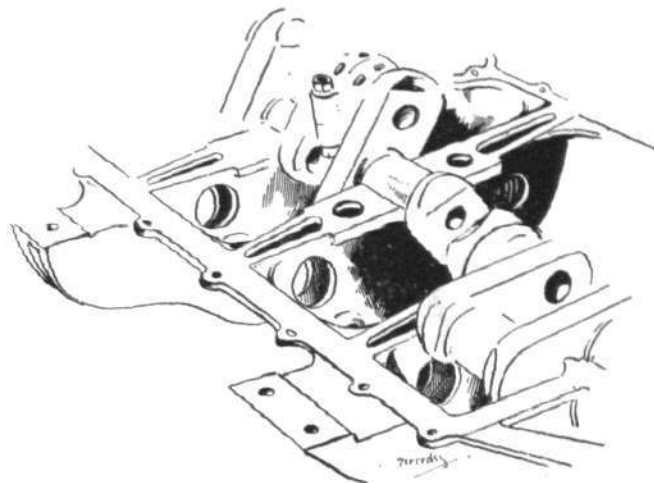
BOTTOM HALF OF THE MERCEDES BASE-CHAMBER, FROM ABOVE.—Centrally, at top, is seen the air intake to the carburettor, which leads from two apertures in the wall of the casting on the other side, as shown in another photograph. Notice how the long steel bolts support the bearings.

"Flight" Copyright.

every part closely for ourselves, and as a result of this examination we are unhesitatingly of the opinion that in respect to design the 160 h.p. Mercedes can teach our own manufacturers little or nothing; indeed, to our way of thinking, the exact reverse may well be the case, for such engines as the Sunbeam-Coatalen, the Green and the new Rolls-Royce undoubtedly surpass it, as also we think do the air-cooled engines of the R.A.F. design. It must be borne in mind, however, when such comparisons are made, that obviously the Mercedes engine has not been designed with a view to maximum power-capacity efficiency, and this for the very good reason that, the propeller being driven from the crankshaft, high revolution speeds were probably not deemed desirable, since the extra efficiency of the engine obtained by revolutions may be rendered nugatory by the decreased efficiency of the propeller resulting from its higher speed of running.

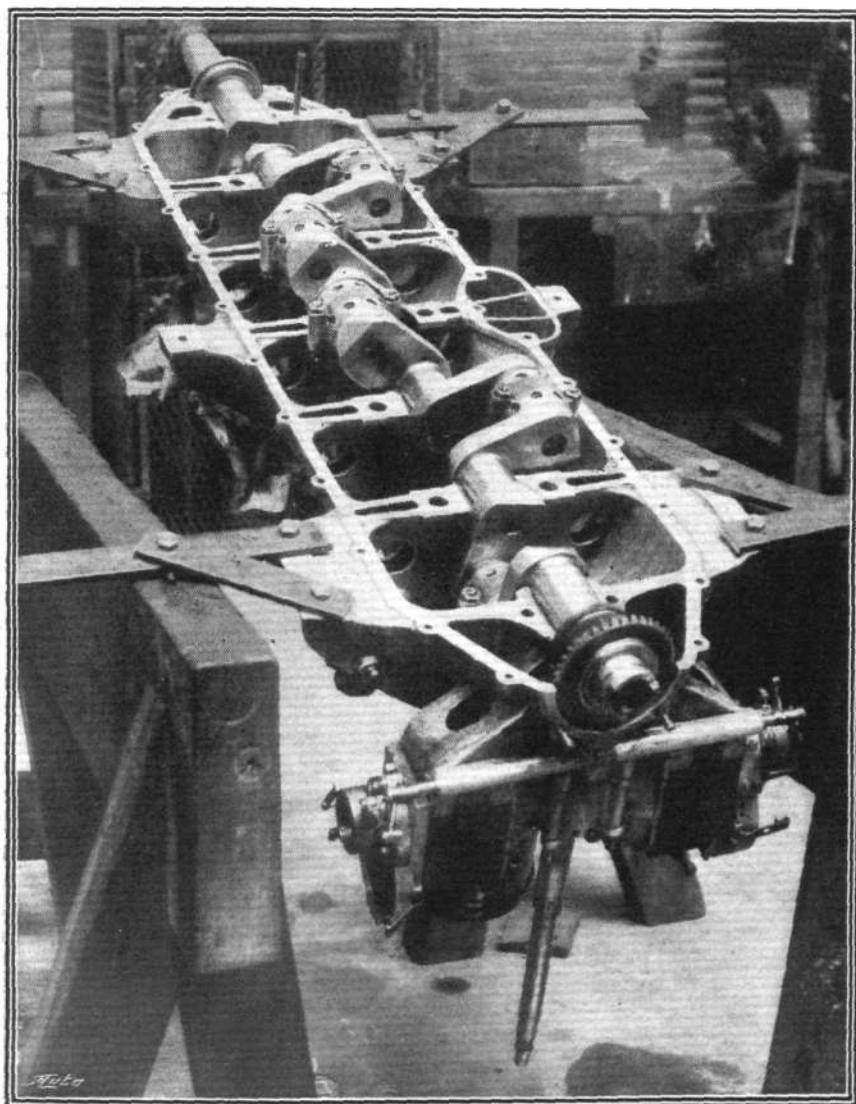
Again, it is possible, of course, that the actual example of Mercedes design that this engine represents is not the latest, and that the engines of this make that are known to give such excellent results are of an improved type. But against this possibility may be set that this engine is practically new, for, except for the damage done to it by shot and shell, there is every evidence on examination

that it has been scarcely more than "run-in." For instance, the big end bearings looked as though they had never been disturbed since they were first fitted, while they were yet so tight as to require a perceptible effort to oscillate them on the crankshaft. Further, the date of



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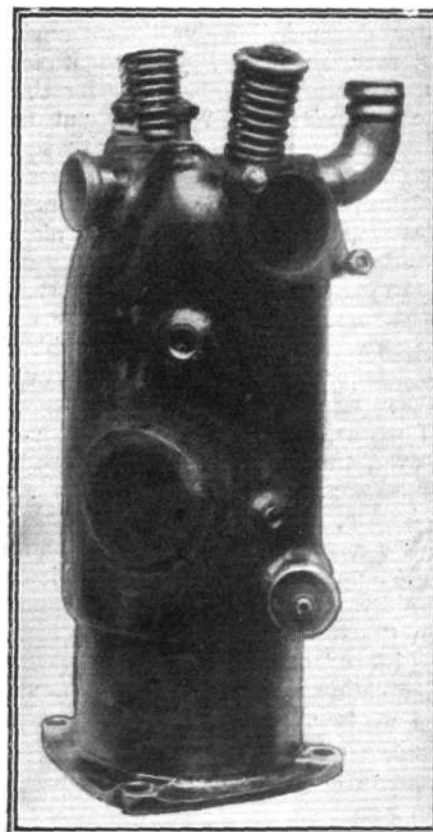
Detail sketch of the partition walls housing the half bearings of the crankshaft in the top half of the base-chamber.



"Flight" Copyright.

Top half of the Mercedes base-chamber inverted, showing the crankshaft in situ, the bevel drive to the vertical shaft, and the magneto platforms.

manufacture of the crankshaft, if the information stamped thereon is to be credited, is the 28th December, 1914. How long before it was built into the engine, and how much time elapsed before the engine was installed in its aeroplane,



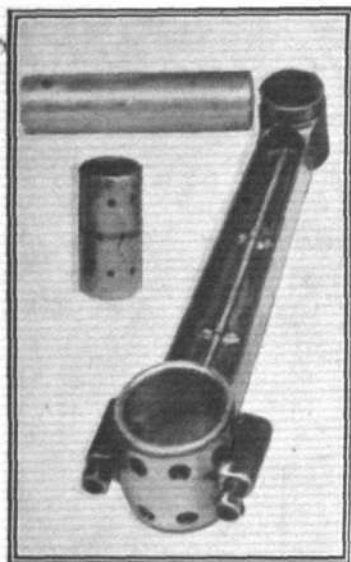
"Flight" Copyright.

A cylinder of the Mercedes engine. This had been damaged by shot, the welded repair to the jacket being plainly visible.

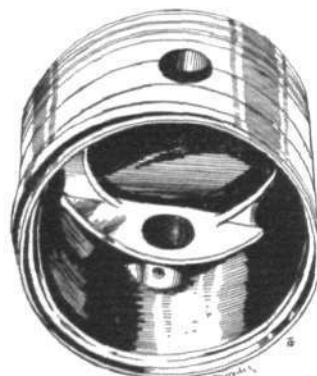
there is no means of telling, but in all probability many months may be accounted for in this way. At all events it may be taken as certain that the design was that existing at a time subsequent to the commencement of the present hostilities.

It is at any rate open to question, too, whether the practical performances of the Mercedes engines—excellent as they certainly

are—are yet superior to those obtainable from the engines with which our own military machines are fitted.



A connecting rod of the Mercedes engine.—The perforated floating sleeve shown rides between the small end and the gudgeon pin.



"Flight" Copyright.
The two-piece piston of the Mercedes engine, the crown and bosses being one part, and the cylindrical wall the other.

We have heard it said time after time that never by any chance does a Mercedes engine let a German aviator down inside our lines from failure in the air. This may be true, but, even if so, the reason may be that German pilots, either for their own protection or acting under orders, make about 12 miles their limit of flight over our lines. Under these circumstances it is easy for Mercedes-engined aeroplanes to be flown at such a height as to be at all times within gliding distance of their own lines, and this we think is—with very rare exceptions—the common practice adopted by their pilots. On the other hand, our own men take far greater risks, often penetrating very great distances behind the German lines, in view of which it is inevitable that sometimes an engine failure should occur that prevents our own lines being regained.

If we are not altogether enamoured of the design, however, the workmanship and finish embodied in the Mercedes are, on the other hand, such as to excite admiration, for they are certainly of the very finest. Moreover, as we said on the occasion of our first notice of the engine referred to above, it is very evident that reliability almost to the exclusion of all else has been the object sought after. This is revealed by the "heftiness" of every internal working part; even in the reciprocating members little or no effort seems to have been made to cut down weight to an extent likely to influence reliability. On the contrary, it is clear the designers have, as we suggested above, been content to

limit revolutions, and by doing so take the advantage permitted to increase the factor of safety, the result being that the Mercedes—as it undoubtedly is—is an engine comparable with an ordinary car engine in the matter of infrequent need for attention and overhaul, long life, and unfailing service except for accident.

It must not be thought from this, however, that the question of weight reduction has not received any consideration whatever. On the contrary, it has evidently been carefully studied, although this is a fact that is not by any means obvious from the exterior. It is in respect to the parts that may be considered as the framework rather than the working parts of the engine that the endeavours in this direction have been directed, especially the crankcase and the cylinders, though nowhere has the achievement of the object been allowed to interfere with the rigidity of the engine as a whole, and therefore with its smooth running potentialities. That the crankshaft, pistons, connecting rods, valve gear, bearings, &c., are of robust proportions will be confirmed by the figures we shall produce in due sequence.

It is by careful and scientific disposition of the metal that the remarkable result obtained has been made possible in the case of the crank-chamber. The shell itself is extremely thin, but in spite of its length is made rigid, one might say absolutely rigid, by the manner in which it is braced. In the lower half there is a double bottom running nearly the whole length, the space enclosed by it forming the oil sump. A series of exterior longitudinal fins below the casting not only give stiffness but also serve as radiators for cooling the oil, and while making mention of this fact it may not be out of place to call attention to a further and more interesting duplication of duties that apparently arises in a similar connection, and that is the manner in which the air to the carburettor is also made to cool the oil, and in doing so to become itself warmed as an aid to good carburation. To this end, the sump does not occupy the full length of the casting, but really forms two compartments in the double bottom, one in front and one in rear connected together by a large diameter tube. Around this tube and between the adjacent end walls of the two compartments, all the air to the carburettor has to pass, there being apertures cut in the side of the crankcase, that lead to the carburettor situated on the other side of the engine.

From practical considerations, however, the last-named feature is certainly one that will not commend itself to the pilot, for it condemns him to serious risk from fire, since the transverse air passage forms a ready receptacle for the accumulation of petrol drippings and also for oil leaks. Should a backfire occur in the carburettor—a prevalent symptom when from any cause the fuel supply begins to fail—the vapour in the passage is liable to become ignited, and to set fire to the oil and not unlikely to the machine itself. That this is a very real danger is evidenced by the fact that designs this side provide for the conduct of the incoming air to the carburettor from a place that is entirely exterior to the cockpit, or sump or housing, a point that is well marked for example in R.A.F. engine design.

(To be continued.)

The Lights of Paris.

IN the House of Commons on January 6th, Sir William Byles addressed a question to the Home Secretary as to the lighting of Paris.

Mr. Brace said he was authorised to reply that no information had reached him that the restrictions on lighting in Paris had been relaxed.

More Aeroplanes from India.

RECENT contributions to the Punjab aeroplane fund, which now exceeds £35,000, includes £5,000 each from the Nawab of Bahawalpur and the Nawab Malik Ata Mahomed Khan of Ala Bagh. The shareholders of the Bombay Cotton Trades Association have subscribed £1,500 for an ambulance or an airplane.

A FIGHTING FLYING BOAT.



OT only is there a great deal of time and thought being given to the production of large fighting aeroplanes in this country, but in America the problem is being strongly attacked. Thus the Curtiss Company are building a huge triplane flying boat of which the following particulars have been given by the

Scientific American:—

"This machine, which can properly be called the first battleship aeroplane, is a direct development of the 'America,' a twin-engine flying boat which was to cross the Atlantic in the summer of 1914, when the outbreak of the war stopped the attempt.

"The Curtiss 'battleship-aeroplane' is a triple-screw triplane flying boat, which will weigh, fully equipped, 21,450 lbs.

"The hull is of cedar planking, sheathed with copper on the under side, and riveted to stout ash ribs; it is 68 ft. long, and has a beam of 20 ft. The hydro-planing surface of the hull is furnished with a V-shaped bottom, which ends in a straight stem forward, while its rear, cut off sharply, gives the 'step,' on which the boat must ride in order to get off the sea. From the step on the hull it has straight side lines, and tapers gently towards the stern, to end with a water-rudder.

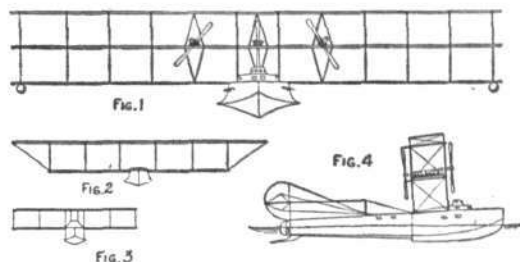
"The hull is divided into twelve water-tight compartments, one-third of which are supposed to keep the machine floating, should the hull be pierced and several compartments be flooded.

"The inner arrangement of the boat consists (1) of a conning tower containing the controls and the navigating instruments, and (2) of a cabin, fitted as quarters for a crew of eight, and containing the fuel tanks, ammunition and stores.

"The boat is steered from the conning tower; when riding a rough sea the latter can be hermetically closed against the spray. The fuel tanks contain 700 gallons of gasoline and 80 gallons of oil; this will give the

machine (at a speed of 75 miles per hour) a cruising radius of 675 miles. This could be considerably increased by fitting additional tanks, in which case the military load (guns, bombs, &c.), would have to be decreased. The superstructure of this battleship aeroplane consists of (1) the supporting planes, (2) the propelling apparatus, and (3) the steering organs.

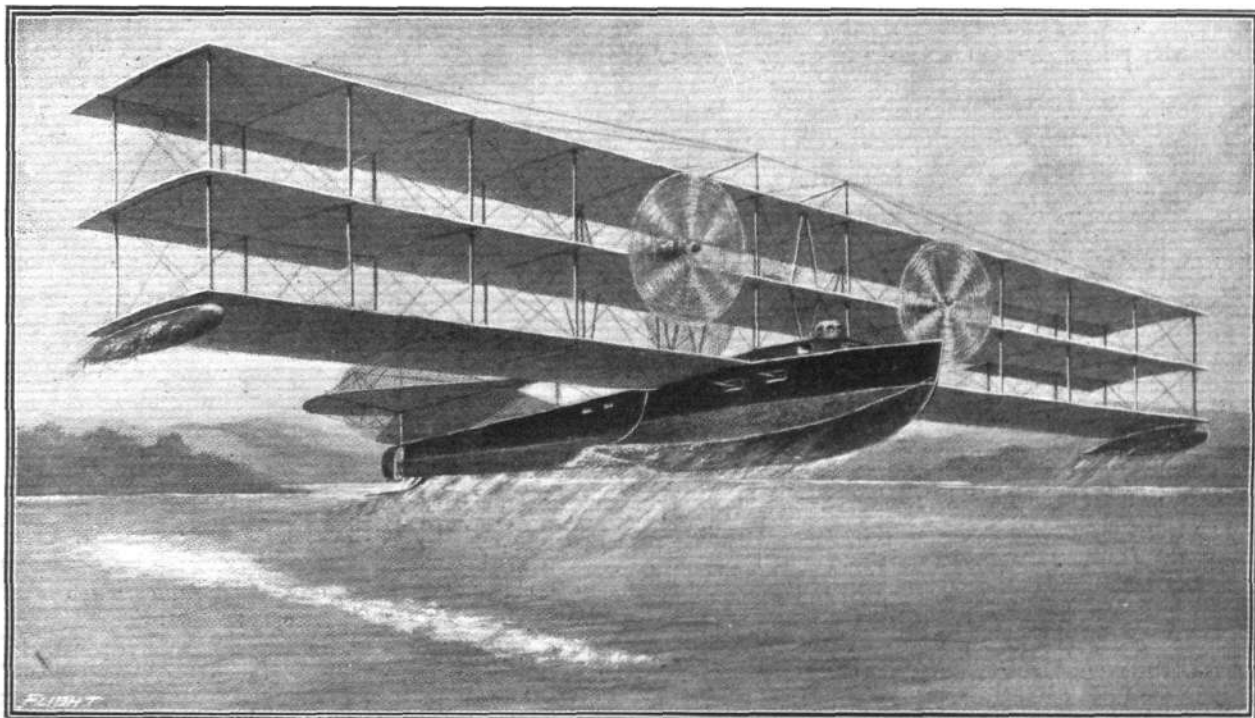
"There are three superposed supporting planes, each having a span of 133 feet and a chord of 10 feet, with a gap of 10 feet between each plane; the total area of



Comparison of the (Fig. 1) new Curtiss fighting seaplane with (2) the America, and (3) the standard Curtiss seaplane. Fig. 4 shows a side elevation of the new seaplane.

support amounting to about 4,000 square feet. The weight of the hull and of the supporting planes amounts to about 12,000 lbs. As customary on marine aeroplanes, the tip of each lower wing is fitted with a pontoon, which prevents the wing from digging into the water when running on the surface or when at anchor.

"Just like the 'America,' which revolutionised aircraft construction with her twin engines, the latest product of the Curtiss yards marks again a new departure in the arrangement of the propelling apparatus. The latter consists of six 160 h.p. water-cooled V-type engines, which are coupled in twin units of 320 h.p., each unit driving an air-screw about 15 feet long. But while one of these twin units is placed amidship and drives a central pusher screw, the two other units are mounted on the leading



A drawing of the new giant Curtiss fighting seaplane.

edge of the centre plane on either side and above the cabin, and each drives a tractor air-screw.

"An auxiliary engine of 40 h.p. enables the pilot to start these engines from the conning tower by means of an electric starter. This engine is also used for generating the current required by the automatic stabiliser, the drift indicator and the minor apparatus. Finally, for water navigation, the auxiliary engine also drives a water propeller.

"Aside from the truly gigantic dimensions of this machine, the disposition of her power plant marks a notable advance in aircraft construction.

"If in an ordinary aeroplane the engine fails, the airman has to glide down to earth in order to effect repairs. In the twin-screw flying boats of the 'America' class this contingency arises just as well, but as long as one engine is kept running, skillful steering will keep the machine on a much longer glide-path, whereby there is much less risk for the pilot to fall into the hands of the enemy.

"But in the new triple-screw flying boat, engine trouble can be dismissed almost entirely as far as the machine's safety is concerned. In fact, each of the three air-screws being actuated by twin engines, the failure of one or two of the engines will only result in reducing the flying speed; and, owing to the great inertia of the machine, a mechanic can easily climb on a ladder to the defaulting engine and promptly repair it without impairing the lateral stability. And, taking it at its worst, should both of the twin engines, which drive the tractor-screws, break down, the engine unit actuating the pusher-screw (320 h.p.) would still give the boat a very wide gliding ratio, about 15 in 1, in the course of which there still would be time to repair the defaulting engines or else to choose the best possible landing place.

"This feature of the new flying boat makes her

particularly desirable for military and naval work, where long range reconnaissances are always fraught with danger on account of the relative unreliability of flight engines.

"The steering organs placed at the boat's stern consist of a balanced rudder of 54 sq. ft. area, with a keel-fin of 46 sq. ft. area. Longitudinal stability is effected by a non-lifting tail, consisting of a tail-fin of 126 sq. ft. area and of an elevator of 96 sq. ft. area. For transverse stability interconnected *aileron*s are hinged to the supporting planes.

"Little is known so far as to the armament this flying boat will carry. Whereas the pure military load (outside of crew, instruments and fuel) amounts to about 3,000 lbs., it can be safely assumed that at least two 1½-lb. aircraft guns, of the type used on the 'America' class, will be mounted on the forecastle, in addition to which there should be a small battery of machine guns for repelling speed scouts. It is possible, however, that the main armament will comprise a much heavier arm, such as a 3- or even a 6-pound gun, and that there will be a trapdoor in the hull through which the said gun could be fired in all directions, owing to a turret mounting.

"The craft will carry a very complete equipment, such as pneumatic life preservers and cushions, fire extinguishers, anchors, ropes, and possibly a collapsible mast for signalling.

"Altogether, there is no exaggeration in saying that the Curtiss triple-screw flying boat opens a new epoch in aircraft construction; and while far from being an aerial battleship such as may be seen in the future, she certainly represents the embryo of such an idea. In the present war she should prove immensely valuable; for in view of her superior armament, cruising radius and sufficient speed, there does not seem to be anything aloft that could meet her on even terms."



"Life is a mirror—smile at it and it will smile back; frown at it and it will frown again."

ENTHUSIAST: "Don't the spectators tire you with the questions they ask?"

AVIATOR: "Yes. What else do you want to know?"—*Jester.*

Hadn't Bargained for that.

"I THOUGHT I was taking an examination for the railway mail service?"

"You are," said the examiner, "you are."

"They ask me how far it is from the earth to the moon."

"What of that?"

"Well," said the candidate, "I hadn't figured on taking an airship run."

Unrecorded Sayings of Popular Pilots and Their Friends.

"Yes, she's quite a jolly little tub to fly."—H. B.

"*Imitation—très difficile.*"—A. A. D. L.

"I HAVE lost count of my pupils now."—F. W. M.

Aerodrome Proverbs.

"WHERE the B.E.s. are there is money."

"LOOK not a gift prop in the boss."

"Two props do not make a (W)right."

"BAD pilots always complain of their 'bus."

TRADESMAN (at the basement door): "Are you insuring against Zeppelins for the New Year?"

HOUSEHOLDER: "Well, I'm thinking of it, as I remember reading in the last raid how they dropped seventeen bombs in one area. I wonder they don't get hit, standing still all that time in the air."—*Punch.*

For the Bruises.

WILLIAM THAW, the young Pittsburg millionaire, who has done such wonderful flying for the French, was being praised at a luncheon party.

"Mr. Thaw," said a pretty girl, "is as brave as he is witty. I saw him make a splendid flight one day, and on his descent I said to him:

"Flying requires some special application, doesn't it?"

"Oh no," said he, "any old kind of horse liniment will do."

Consoling.

NERVOUS PASSENGER: "My, oh, my. Isn't the 'plane going at a fearful rate?"

OLD LADY (in the rear): "Yes, deedy. My boy Jimmy is engineer on this 'plane, and he certainly can make her spin when he gets a drop too much in him."—*Froth.*

AIRCRAFT WORK AT THE FRONT.

OFFICIAL INFORMATION.

British.

General Headquarters, Jan. 5th.

"A NUMBER of our aeroplanes carried out a successful bombing raid against the enemy's aerodrome at Douai.

"A German aeroplane to-day flew over Boulogne and dropped a few bombs. No damage was done."

General Headquarters, Jan. 6th.

"In addition to the raid on the aerodrome at Douai, another bombing raid was carried out yesterday by eleven of our machines against a stores depôt at Le Sars."

General Headquarters, Jan. 8th.

"A German aeroplane dropped two bombs behind our lines north of the Somme to-day, but failed to do any damage."

General Headquarters, Jan. 10th.

"Hostile aircraft dropped bombs near Strazeele, Hazebrouck, and St. Omer. One woman and one child were killed."

French.

Paris, Jan. 9th.

"On the morning of the 8th enemy aeroplanes bombarded the Allies' cantonments in the vicinity of Salonica. The material damage was insignificant. One of the aeroplanes was brought down by our artillery fire."

Italian.

Rome, Jan. 5th.

"On January 3rd, two Austrian aeroplanes flew towards Verona, but were beaten back by the fire of our anti-aircraft batteries before reaching their objective. They fled in a northerly direction and dropped some bombs, which caused no damage."

Rome, Jan. 6th.

"Enemy aircraft continued to make numerous raids in

the valleys of Lagarina Bugana and Dogna and in the Upper Isonzo. They dropped bombs in various places, which, however, did no damage."

Montenegrin.

Cettinje, Jan. 5th.

"An Austrian aeroplane fell near Dulcigno. Its occupants were taken prisoners."

Cettinje, Jan. 6th.

"Austrian aeroplanes have been displaying particular activity to-day. They have dropped numerous bombs on our Lovtchen positions and three on Cettinje without any result."

German.

Berlin, Jan. 6th.

"An enemy air-squadron attack on Douai had no success. German battle aeroplanes shot down two English aeroplanes, one being shot down by Lieutenant Boelke, who thereby placed *hors de combat* his seventh enemy aeroplane."

Berlin, Jan. 10th.

"A German aeroplane squadron attacked the enemy warehouses in Furnes."

Austrian.

Vienna, Jan. 5th.

"Our airmen dropped bombs on military buildings at Ala and Strigno."

Turkish.

Constantinople, Jan. 7th.

"Lieutenant Ryck Boddike attacked a French aeroplane which was flying over the Straits and brought it down on the Anatolian coast near Akbanch. The French pilot was found dead. The aeroplane can be easily repaired."

AIRCRAFT AND THE WAR.

AN Exchange message, dated Athens, January 3rd, says:—

"French aeroplanes have successfully bombed Austrian camps at Ghevgeli."

The *Echo Belge* on January 5th learned from Ghent that on the previous day two Allied aviators dropped eight bombs on some German military depôts west of Roosebeke.

The Sofia correspondent of *Vossische Gazette* last week telegraphed:—

"In order to avoid 'unfortunate incidents' by airmen Greece has made known to the German command the exact whereabouts of each section of the Greek Army."

The *Mattino* correspondent at Salonika, under date January 5th, reports:—

"French aviators have bombarded Petric, a Bulgarian town close to the Greek frontier, destroying two bridges and killing about fifty Bulgarians."

Reuter's correspondent at Salonika on the same subject, says:—

"French aviators in the last few days have made frequent flights over the enemy lines, and have dropped bombs on Petrich, Strumnitza, and other towns and villages where movements of troops were observed."

"Although they were fired on by the German artillery none suffered any damage. On the other hand, it is believed that their

bombs caused considerable casualties, especially at Petrich, where they were seen to explode in the middle of the town, causing buildings to collapse and fires to break out."

The Paris correspondent of the *Pall Mall Gazette*, writing under date of January 5th, says:—

"Two German airmen captured on the Russian front declare that the enemy possess a new type of defensive aeroplane which is far beyond anything so far produced by the Allies, and upon which the greater hopes are placed by the German high command."

"Although communicative enough in all other respects, the two men declined to mention any characteristics of the new machine beyond saying that it was kept in readiness to the rear of the German lines, and never ventured into hostile territory, since it was built for defence purposes only."

"These officers explain that the recent falling off in activity on the part of the German air service was owing to shortage of petrol, and especially of lubricating oil. Otherwise, they declare, Germany has every reason to be satisfied with her aerial fleet."

"The new German scouting aeroplanes are very fast and yet most strongly built. They are designed to keep the air for hours on end and to cover immense distances. The recently introduced 'invisible planes' are a great success, not so much because they are literally invisible, but because their curious composition renders it impossible to judge with any accuracy their position in the air, and this makes them peculiarly immune from attacks."

"As a rule, they appear to be much higher than they really are, and, thanks to this illusion, they can venture to fly unusually low. This is a great advantage for purposes of observation."

"As is already known, a fresh type of attacking aeroplane has been added to the German army within the past month or so. It

has two tails, and carries an armoured car between the two fuselages mounted with four quickfiring, two in front and two behind.

"These aeroplanes are driven by a couple of engines of 250 h.p. each, and are very powerful machines in every respect.

"The very latest are fitted with an arrangement by which a third quickfiring can be fired from the centre of the propeller, a method which has enabled these machines to wreck practically every Allied craft that has engaged them.

"On being pressed, the captured airmen admitted that it is becoming somewhat difficult to find pilots for all the machines available, although there is a great eagerness among the younger recruits to be trained in airwork. Naturally, it is a long while before they become efficient, and even then many are really too young for the work; they are venturesome enough, but audacity is not everything."

The *Standard Athens* correspondent on January 6th reported:—

"Two German aeroplanes appeared this morning over Topsis. They dropped six bombs on the Allied positions, but it is not known if any damage was done."

Messages received in Rome on January 6th from Salonika stated:—

"Air scouts have confirmed the news that numerous Bulgarian detachments have crossed the frontier and pillaged Greek villages. They also report heavy Germano-Bulgarian masses of troops are advancing along the Doiran-Ghevgeli route. Fifteen thousand Austro-Germans are concentrated at Monastir. A Bulgarian division has left Stiuga for Albania."

"French aviators who flew over the enemy's lines beyond Petric and Strumnitza Station, dropping numerous bombs, state that everywhere enemy bands are concentrating towards the frontier. Already seven Bulgarian and four German divisions are concentrated."

Reuter's correspondent at Salonika, under date January 7th, reports:—

"A French aeroplane had an exciting adventure this morning. It was returning from a reconnaissance over the enemy lines when it was overtaken by two Taubes bound for Salonika. The French machine, armed only with a rifle, opened fire, the Germans replying with a machine-gun.

"While the aerial engagement was going on anti-aircraft gunners below opened fire, but in the meantime the French aeroplane was damaged by a bullet and compelled to alight. The pilot was also wounded. The descent of this machine probably gave rise to the report that a Taube had been brought down.

"The German machines were compelled to retire by the splendid fire of the anti-aircraft guns which grouped shells all round them. A number of bombs were dropped on both the French and British camps, but no damage was done beyond a few casualties."

The *Times* correspondent at Salonika on January 8th reported:—

"German airplane attacks are now becoming of daily occurrence, though so far without causing any appreciable damage."

On the same day the *Times* correspondent at Athens said:—

"The frequency with which the Germans are carrying out air reconnaissances over Salonika, together with other indications, may, in the view of observers here, portend an early invasion by the enemy. The outlook causes anxiety in official circles.

"There is confirmation for the report that one enemy airplane has been shot down.

"The day before yesterday French airplanes bombarded a Bulgarian camp at Petritch. They threw 16 bombs, which did considerable damage."

An Exchange message from Athens dated January 8th says:—

"It is learned from Salonika that among the bombs thrown by two German aeroplanes during a fresh incursion on Saturday, one fell near the barrack room of the Greek telegraphists corps, damaging the neighbouring houses."

The *Petit Journal* on Monday stated on the authority of its Athens correspondent:—

"The frequent reconnoitring operations carried out at Salonika and along the whole of the Allied front by enemy aeroplanes are regarded here as a sign of an early attack.

"It has been ascertained that important German reinforcements have concentrated in the region of Monastir."

Mr. George Renwick, writing to the *Daily Chronicle* from the French front in the Balkans, under date January 7th, gives the following vivid description of the air fighting:—

"It's just the sort of day for an aeroplane raid.' I was wandering along the front line of trenches of the French position this morning when the officer in whose company I was made that remark. Instinctively we turned our glasses upwards and peered into the bright blue of the northern horizon. There was a yellow French Avion, tiny with distance, rushing northwards at a height of two to three thousand yards. It disappeared into the haze of the distance away towards the frontier.

"Shortly afterwards, two white specks, lit up brightly by the sun, could be seen coming out of the dimness into which the French aviator had disappeared. 'Taubes!' exclaimed the officer with me, and Taubes they certainly were, for the black cross on the wings was plainly visible through our glasses.

"They were flying at a greater height than the French Avion we had just seen. Suddenly that aircraft came into sight again, coming south in rapid pursuit of the enemy machines. It had met the southward-bound raiders, and was skimming up into the sky after them.

"For a while, as the three aircraft sped across the sky, I watched them. 'We are too far away to hear the noise of their engines or machine-guns,' said the officer with me, 'but I'll wager they are having a fight.' They disappeared from sight, and then the French aeroplane returned at a much lower level, circled above us, and landed some distance beyond the French lines.

"While this was happening the raiding Taubes could be seen flying north again. And a battle in the high air there had been. The French airman had encountered two German flyers coming south, and had turned in pursuit.

"Gaining their level, he opened fire and slung to the chase though armed only with a rifle.

"The Taubes replied with machine-gun fire, and, for a time, a vigorous, if ineffective, fire was kept up. Unluckily, the Frenchman had to give up as a bullet pierced part of the machinery of his aeroplane and another wounded him slightly.

"Just as he turned to descend, the anti-aircraft guns on the positions below took up the battle, and, before good practice was made, the Germans turned and fled northwards. Shrapnel puffs could be seen grouping themselves dangerously near the two enemy machines."

Later.

"Several German aeroplanes again came southward towards Salonika, one of them flying over the city. A number of bombs were dropped, but no damage was done of any importance, and no casualties are reported.

"The machine which flew over the city dropped two bombs harmlessly in the harbour. The land anti-aircraft guns, as well as those of the fleet, came into action and the raiders quickly made off. 'Yesterday's raiders did not come within 14 miles of the city.'"

Mr. G. Ward Price, writing to the *Daily Telegraph* from Salonika on Saturday evening, said:—

"Five enemy aeroplanes yesterday came bomb-dropping towards Salonika, but they caused insignificant casualties. Another appeared to-day—a ghostly, white, moth-like dot, high in the blue sky.

"Yesterday's story that the French machines which chased off the raiders saw one crash to earth amidst a cloud of smoke is, unfortunately, untrue."

On the same date Mr. G. J. Stevens, the *Daily Telegraph* correspondent at Athens, reported:—

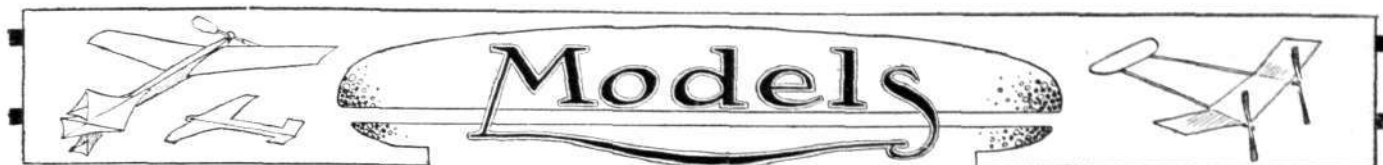
"Two German aeroplanes again visited Salonika, and dropped bombs at a place called Lebet. They were fired upon by our aerial batteries. One Taube was brought down, falling 13 kilometres outside Salonika. The other was seen to descend rapidly, but it succeeded in escaping."

Mr. H. Warner Allen, the Bristol Press representative with the French armies, in a despatch last week dealing with the long range bombardment of Nancy, says:—

"The Germans probably realised that their bombardment was a failure, as the next day they sent a Zeppelin, and the day after an aeroplane, which dropped a few bombs about the place, made a great deal of noise, and scarcely succeeded in frightening anyone."

An Exchange message dated Athens, January 9th, says:—

"A despatch from Salonika states that a flotilla of French aeroplanes flew over Sofia and dropped bombs, causing considerable damage, and creating indescribable panic among the inhabitants."



ALL communications in connection with this section should be addressed to the Model Editor, "FLIGHT," 44, St. Martin's Lane, London, W.C. Correspondents are requested to write on one side of the paper only.

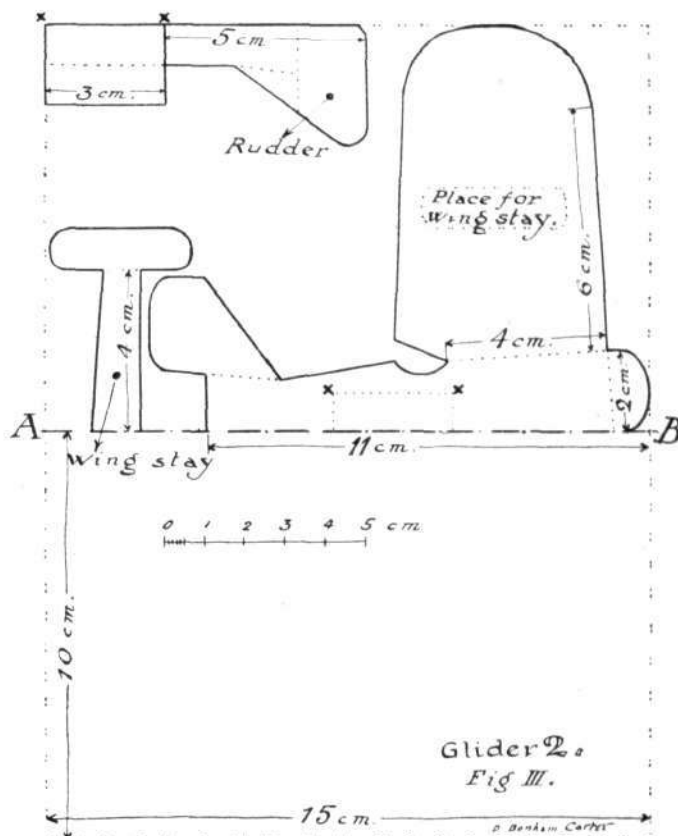
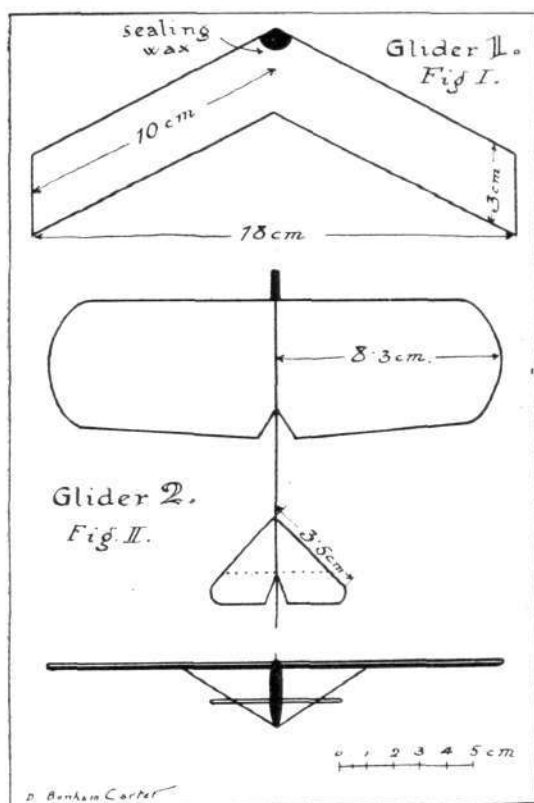
Paper Models.

FROM Mr. D. W. Bonham Carter we have received the following instructions for making paper models, and although they in some ways repeat information which has already appeared in these columns, they will doubtless be welcomed by new readers:—

"Having seen in recent numbers of 'FLIGHT' descriptions of paper model gliders, I think that perhaps particulars of those which I have used might interest your readers. A description of one of these types has already appeared in 'FLIGHT':—

"The simplest form of glider is probably a plain piece of fairly

which serves as a stabilising fin. The two halves of the fuselage are then stuck together. Any good paste may be used for this ('Ivy Brand Vegetable Glue,' made by Walters and Walters, Mildmay Grove, London, N., is recommended). One of the rectangular pieces can be folded in half, and stuck on each side of the fuselage. In some cases, if the paper is very stiff, this is not necessary. Stick the two end portions of the wing stay on the place marked "Place for wing stay" on the under surface of both wings. A slight camber added to the wings increases their efficiency.



Figs. 1 and 2.—Two of Mr. Bonham Carter's gliders. Fig. 3.—Working drawings for paper glider by Mr. Bonham Carter.

stiff paper cut into the shape of the Dunne monoplane, and weighted by sealing wax in the front. The wing tips have to be slightly bent up at the back. By bending one wing more than another it is possible to make the model turn to the right or the left. (To make the glider turn to the right bend up the right wing tip, and *vice versa*.) It is advisable to make a facsimile of the glider in ordinary paper first, and to draw round this on the stiff paper, to prevent it being necessary to fold the actual glider. (Fig. 1.)

"The second type of glider is slightly harder to make. It is a monoplane of the parasol type. Of course, the shape of the wings can be cut so as to reproduce different makes of aeroplanes. Fig. 2 represents the plan of the glider. A sheet of stiff paper not smaller than 20 by 15 sq. cms. should be first procured, as in Fig. 3.

"This should be folded in half along A B. Then cut round the outline. No dotted lines should be cut. Notice should be taken of the rectangle in a corner of the paper; this must be cut out, as well as the rudder placed near it. When this is done, the two wings and tail planes must be bent along the dotted line in Fig. 3. Then stick the rudder in position between the tail planes so that only the part marked "rudder" projects beyond the end of the fuselage. The rest is then covered by the fuselage, except the small triangle

"Now all that remains is to add a weight. This can be done by fixing a row of paper fasteners along the upright portion of the projecting nose of the glider, and then securing this by binding a small quantity of narrow surgical plaster round these. If this is not heavy enough sealing wax may be placed between the layers of plaster; it should not be placed outside or it will crack and fall off when hitting any hard object during the glide. If these models are intended to loop, they should be strengthened by a piece of stiff paper stuck, on each side of the fuselage, at the angle formed by the under surface of the wings and the fuselage."

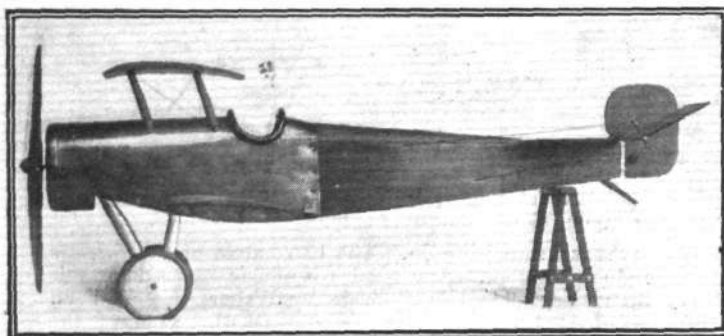
A Model Bristol Scout.

From South Lowestoft Mr. Lewis E. Richards sends a photo. of a beautifully-made Bristol scout, of which he says:—

"Enclosed herewith are photos. of a model Bristol Scout, Type C, 1915, constructed a few months back, which might interest your Model Section.

"Made almost entirely of mahogany and copper, to a scale of $\frac{1}{12}$ th, it was primarily intended as an exhibition working model, having in view the suggestion I put forward in your columns last February in connection with the Flying Services Fund.

"Not the least interesting features incorporated in its construction are a special copper stamping for the engine housing, and a laminated



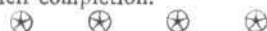
Model of a Bristol scout fuselage by Mr. Lewis E. Richards.

air screw, whose shafting is coupled to a motor and driven by a dry battery in the fuselage.

"Controls are functioned by levers situated in the cabane, including a device for starting up and switching off the motor. To facilitate dismantling and inspection, all members are readily and easily detachable.

"Details have engaged closest attention, and to ensure accuracy, blue-prints were supplied through the courtesy of Messrs. the British and Colonial Aeroplane Co., Ltd., to whom I am greatly indebted for their kind and valued assistance.

"The planes are only shown in section, pressure of business having prevented their completion."



French Pilot Escapes from Germany.

WRITING on Sunday, the Paris correspondent of the *Daily Telegraph* said:—

"M. Henry de Pracomtal, son of the Marquis de Pracomtal, and an aviator since the beginning of the war, has just arrived in Paris, after endless adventures. Over a year ago he was wounded in the leg while flying, and was captured with his aeroplane and interned in Germany. He refused to give his parole, and after some months' imprisonment escaped, but was recaptured and locked up in solitary confinement in a fortress. He has at last regained his freedom by means which it is best not to publish. He tramped some 180 miles by night, hiding by day, and at last reached Swiss territory, whence he travelled to Paris."

Why the Zeppelin Went to Sofia.

THE *Daily Mail*, on the 7th inst., published the following interesting story from its Parisian correspondent:—

"The King of Bulgaria, according to Balkan advices, has an exaggerated fear of aeroplanes. When he learned that English and French airmen were co-operating with the Serbian Army he became very anxious, and was reduced to a state of terror on hearing that aircraft had been landed at Salonica.

"He immediately summoned a Ministerial Council and, declaring that it was necessary to protect Sofia from hostile raids, ordered all the Bulgarian airmen to be recalled from the front. A bomb-proof roof was erected over the royal palace and at night search-lights swept the sky ceaselessly.

"The trembling monarch even asked the Kaiser to send a Zeppelin, and despatched feverish telegrams to hasten its voyage. When it arrived at Sofia King Ferdinand conferred decorations on all its officers. The Zeppelin commander asked the Sovereign when he was to leave for the front. 'I don't know,' was the reply. 'You had better pass the winter at Sofia.' From that day the airship has not gone beyond the outskirts of the capital."

Double Fatality near Eastbourne.

ON January 10th a biplane while flying near Hampden Park, Eastbourne, crashed to the ground from a height of 150 feet. The two occupants, Lieut. Gordon Duke, a Canadian, and Warrant Officer Fraser, an Australian, were both killed.

The Green Engine Co.

MR. FRED MAY, the managing director of the Green Engine Co., Ltd., is desirous of contradicting very emphatically the rumour which appears to be about to the effect that the Green engine has been taken over by an Aeroplane Construction Company. It is entirely without foundation. And once again, how do these rumours get currency?

Ignition Wires for Aircraft.

It seems almost superfluous to enlarge upon the necessity of having perfect wiring, and recognising this fact Messrs. Brown Brothers, Ltd., of Great Eastern Street, E.C., are marketing special covered ignition wire. That the merits of this wire are fully recognised is proved by the fact that it is largely used by the majority of constructors. A large stock is always on hand. Any quantity can be immediately supplied on receipt of a wire or 'phone message.

CORRESPONDENCE.

L. Blériot (Aeronautics).

[1916] As general manager of the English business of L. Blériot (Aeronautics), I have been asked whether this business is in any way affected by the winding-up petition which has lately been filed against the Blériot Manufacturing Aircraft Co., Ltd. I should like an opportunity of explaining that the business of L. Blériot (Aeronautics) is in no way affected by the petition filed against the Aircraft Co. Some time ago M. Blériot entered into a contract for the transfer of his business to the Company, but the business has not, in fact, been transferred. M. Blériot has what he considers to be very good and sufficient reasons for declining to make this transfer to the new company, but owing to certain litigation which is pending, I am at present precluded from discussing these reasons in the public press. Meantime, the business of L. Blériot (Aeronautics) belongs entirely to Monsieur L. Blériot. It is being conducted by me on his behalf, and is solely employed on Government service.

NORBERT CHEREAU.

L. Blériot (Aeronautics), Brooklands Aerodrome, Byfleet, Surrey. January 6th, 1916.



PUBLICATION RECEIVED.

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IMPORTS AND EXPORTS, 1914-1915.

AEROPLANES, airships, balloons, and parts thereof (not shown separately before 1910). For 1910 and 1911 figures, see "FLIGHT" for January 25th, 1912; for 1912 and 1913, see "FLIGHT" for January 17th, 1914; and for 1914, see "FLIGHT" for January 15th, 1915:—

| | Imports. | | Exports. | | Re-Exportation. | |
|--------------|----------|--------|----------|---------|-----------------|--------|
| | 1914. | 1915. | 1914. | 1915. | 1914. | 1915. |
| January .. | 5,945 | 20,382 | 210 | 435 | 879 | 13,706 |
| February .. | 28,132 | 380 | 106 | 138 | 441 | 18,823 |
| March ... | 27,731 | 280 | 1,934 | 7,218 | 1,440 | 5,090 |
| April ... | 11,384 | 2,189 | 1,175 | 23,986 | 1,473 | 275 |
| May ... | 17,062 | 178 | 4,059 | 12,530 | 9,484 | 8,250 |
| June ... | 15,967 | 5,469 | 5,082 | 3,730 | 142 | 2,400 |
| July ... | 15,548 | 1,240 | 4,994 | 13,372 | 1,695 | — |
| August ... | 52,448 | 664 | 630 | 36,276 | 910 | 247 |
| September .. | 4,859 | 536 | — | 4,908 | — | — |
| October ... | 39,287 | 1,344 | 325 | 17,702 | — | — |
| November .. | 24,598 | 1,859 | 141 | 21,979 | 104 | — |
| December .. | 32,298 | 1,293 | 1,031 | 28,192 | — | — |
| | 275,259 | 35,814 | 19,677 | 170,466 | 16,568* | 48,791 |

* The total given in the official publication is £17,128, but it requires some explanation, as this does not tally with the detailed monthly figures for 1914.



Aeronautical Patents Published.

Applied for in 1914.

Published January 13th, 1916.

24,594. E. R. CALTHROP. Slings for use with parachutes.

FLIGHT.

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